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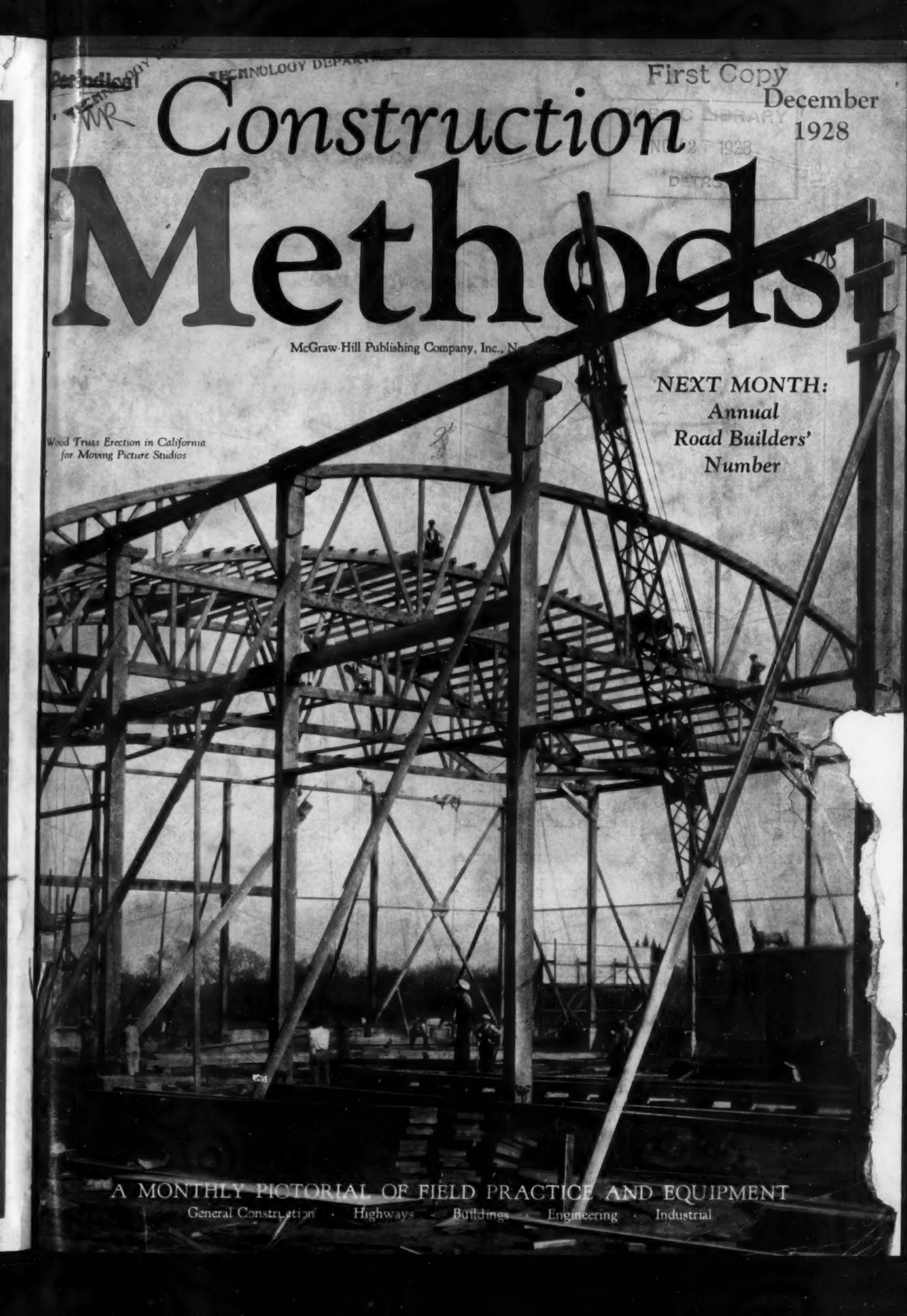
Construction Methods

December
1928

McGraw-Hill Publishing Company, Inc., N

NEXT MONTH:
Annual
Road Builders'
Number



Wood Truss Erection in California for Moving Picture Studios

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In cases too numerous to mention, I-R Portables are furnishing the air so necessary on the country's big construction jobs. Operating riveters, drills, and many other pneumatic tools, they are speeding up the work and eliminating the losses caused by breakdown and delay.

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Construction Methods, December, 1928, Vol. 10, No. 12. Published Monthly. McGraw-Hill Publishing Company, Inc., Tenth Ave. at Thirty-sixth St., New York, N. Y. Two years for $1; per copy, 5 cents. Entered as second-class matter, October, 1926 issue. Vol. 8, No. 10, at the Post Office at New York, N. Y., under the Act of March 3, 1879. Printed in U. S. A.

TECHNOLOGY DEPT.

Keep Construction Going During Winter

CONSTRUCTORS, even in the Northern states, have pretty generally abandoned the idea of a wholesale shut-down of field operations during winter. During the last few years there has been a progressive increase in the amount of winter construction, with a consequent flattening out of the old seasonal humps and depressions in the curve of construction output. While practices have not been codified or standardized, constructors have made definite progress in perfecting the technique of winter construction. Enough experience and a wide enough range of improved equipment and materials are now available to enable contractors to approach winter construction with confidence.

At this season of the year it is particularly timely that the principles and practices of safe winter construction should have been assembled in book form by Charles S. Hill, associate editor of *Engineering News-Record*. The volume, just issued by the McGraw-Hill Book Co., under the title "Winter Construction Methods," presents more complete information on the subject than is elsewhere available in any one place. It is not a theoretical treatise, but rather a compendium of practical information indicating to the man on the job the methods, the equipment and the materials best adapted to handling work under cold-weather conditions.

Among the subjects covered are the winter efficiency and servicing of labor; water supply, fire protection and camp heating; construction elements affecting winter work; transportation and storing materials; winter care and service of equipment; excavation and embankment construction; concrete pavement and bridge construction; special concrete, cement and admixtures; heating of concrete materials; handling and placing concrete in cold weather; protecting concrete in heavy sections; canvas housing for

CONSTRUCTION METHODS

A monthly review of modern construction practice and equipment

PUBLISHED BY
McGRAW-HILL PUBLISHING COMPANY, INC.
TENTH AVENUE AT 36TH ST., NEW YORK

building construction; and building within complete inclosures.

Long experience on construction work and intimate contact with construction men throughout the country equip Mr. Hill to speak with authority on winter construction. His findings have a real dollars-and-cents value.

Shoving Off to a New Job?

It's all in the day's work for construction men to move from job to job as new projects open up or old ones are completed.

That's an old story to us, for we've been dealing with the field men of construction and industry ever since this paper was published.

Here's the point: When your old work closes down and you are ready to "shove off" for a new location make sure that your copy of *Construction Methods* follows you. Send us both your *new* and your *old* addresses, so that we can correct our mailing lists and get the paper to you promptly every month.

We don't care how many changes of address you request. We're geared up to handle any number of them you want. So many of you men whom we meet out on the job tell us you like our graphic method of editorial treatment and find it helpful, that we know you want the paper coming along regularly.

So, when you make a change, send along your new address. A postal card to Tenth Ave. at 36th St., New York, will do the job.

"THE PROBLEM in nearly all industries is not a lack of business, but the failure to maintain prices that include a reasonable profit. Business men are now called upon to blaze a new trail."—*Charles F. Abbott, in his annual report as executive director of the American Institute of Steel Construction.*

A New President for McGraw-Hill

JUST after last month's issue of *Construction Methods* was mailed to its subscribers, an important change in the administration of the McGraw-Hill Publishing Company was announced. Recent growth has made it advisable to separate the offices of Chairman of the Board and President of the company. James H. McGraw, founder of the organization, has resigned as president to become chairman of the board, carrying responsibility for the broader aspects of the company's business. As chief executive officer he is now succeeded by Malcolm Muir whose elevation from vice-president to the presidency follows 23 years of service with the McGraw-Hill organization and upholds the company tradition of promotions from within the organization.

As the Year Closes

The year coming to a close marks an important milestone in the progress of *Construction Methods*. In 1926 when this publication was acquired by its present owner, the McGraw-Hill Publishing Company, we believed that there was a real need for a paper devoted exclusively to the field man—the man responsible for actually planning and executing the work of construction. *Construction Methods* was the answer. You will remember that we started from scratch without a single subscriber. Today an army of nearly 27,000 construction men have told us through their subscriptions that they need and value the paper. That army is gaining recruits every month.

Therefore, this note of appreciation to you who have so generously registered your indorsement of what we are trying to do and who are thereby helping us to make *Construction Methods* even more worthy of your splendid co-operation. For all of you heartiest good wishes for a Merry Christmas.

Draw Your Own Conclusions

From These Actual Job Tests

Concrete as commonly mixed and placed reaches a compressive strength of about 2000 pounds per square inch in 28 days. The following examples show what you can accomplish with the standard grade of Universal cement in a fraction of this time.

2494 lb. concrete in 3½ days
Heavy-Duty Foundry Floor
Du Bois, Pa.
Alfred Johnson, Du Bois, Pa., *contractor*

2780 lb. concrete in 3 days
Street Pavement
Lake Forest, Ill.
Johnson & Anderson, Chicago, *contractor*

2255 lb. concrete in 65 hours
Bridge Floor
Minot, N. Dak.
P. L. Elliott, Minneapolis, *contractor*

2047 lb. concrete in 20½ hours
Highway Pavement
Amnicon Falls, Wis.
A. N. Nelson, Duluth, *contractor*

2655 lb. concrete in 2½ days
Sewer (*Intercepting Chamber*)
Chicago Sanitary District
E. J. Albrecht, Chicago, *contractor*

2115 lb. concrete in 3 days
Roof Slab (*A Winter Job*)
Morgantown, W. Va.
Consolidated Construction Co.,
Wheeling, W. Va.

4387 lb. concrete in 3 days
Street Intersection
Downers Grove, Ill.
A. E. Bounsall, Kenosha, Wis., *contractor*

3303 lb. concrete in 7 days
Manholes for Conduit
Chicago (*Commonwealth Edison Co.*)
Bates & Rogers Construction Co.
Chicago—Cleveland

When You Get One, You Get All Three

1. ***Strong concrete in 3 days***

With the usual materials, usual equipment, usual labor and usual Universal cement, you can secure at 3 *days*, concrete that is stronger than ordinary concrete at 28 *days*.

2. ***Permanently stronger concrete***

As shown in the diagram above, *High-Early-Strength* Universal Concrete not only has a high 3-day strength but is *permanently stronger* than concrete as ordinarily mixed and placed.

3. ***Denser and more durable concrete***

In addition, the methods by which *High-Early-Strength* Universal Concrete is obtained produce a denser and more durable concrete.

Description of methods for securing on the job strengths comparable to any of those shown above will be sent on request.

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Without obligation, please send me your new booklet giving full details for securing strong concrete in 3 days with the usual materials and labor.

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Construction Methods

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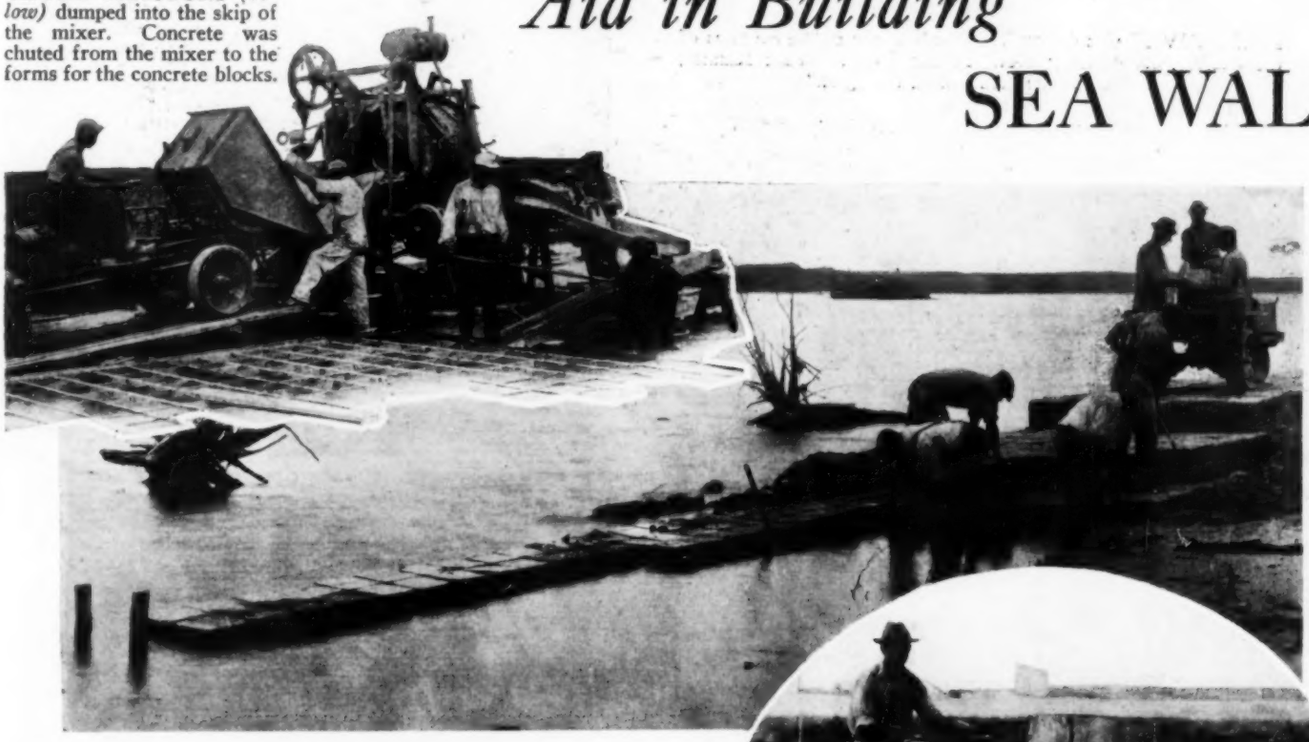
A monthly pictorial of field practice and equipment illustrating successful construction, maintenance and material-handing methods for general construction, highways, buildings, industrial plants and public works and utilities

ROBERT K. TOMLIN, *Editor*

WILLARD CHEVALIER
Publishing Director

VOLUME 10 | NEW YORK, DECEMBER, 1928 | NUMBER 12

TRUCK TRACTORS *Aid in Building* SEA WALL

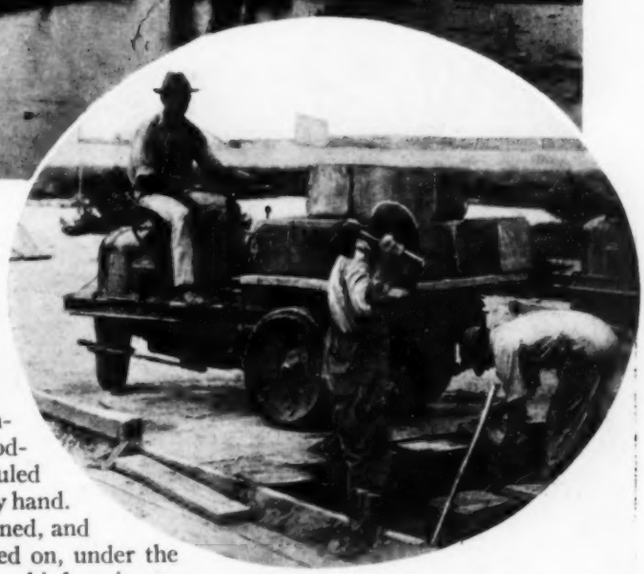


TRUCK TRACTORS *(below)* dumped into the skip of the mixer. Concrete was chuted from the mixer to the forms for the concrete blocks.

TRUCK tractors and sectional plank roadway recently enabled G. O. Reed, Inc., of Miami Beach Fla., to haul materials over the sandy soil of Fisher's Island in constructing a sea wall of concrete blocks made from native pit-run sand and coral rock. The roadway sections were made of 2x6-in. planks nailed to cross pieces, the alternate planks projecting in such a way that they interlocked with those of the adjoining section. Four men could lift one of the 12-ft. sections and load it on a tractor, carrying a net load of 3,000 lb.

At the block-casting yard the Clark truck tractors loaded with the pit-run aggregate dumped into the mixer skip. Concrete was chuted from the mixer to the forms. When the forms were stripped, the blocks were loaded on to platforms built by the contractor to replace the bodies on the tractors, hauled to the wall and placed by hand. The sea wall was designed, and construction was carried on, under the direction of J. P. Duffy, chief engineer, Carl G. Fisher Properties, Miami Beach. R. W. Reed, general manager, G. O. Reed, Inc., had charge of operations. H. C. Carver was superintendent for the contractor, in charge of field work on the sea wall construction.

BLOCKS were hauled to the wall and placed by hand.



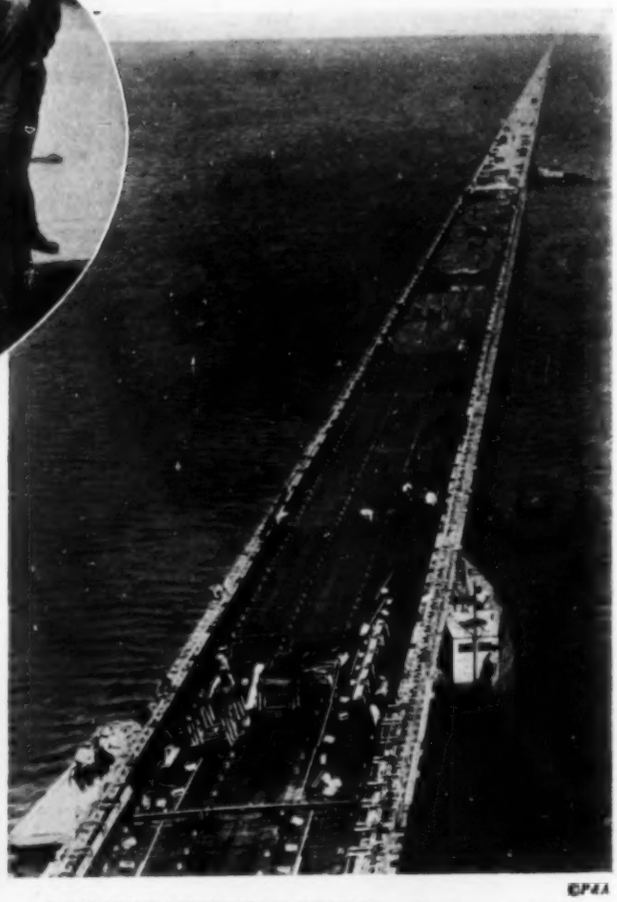
BODY WAS REMOVED from truck tractor and was supplanted by a platform built by the contractor. Forms were stripped from blocks which were loaded on truck platforms.

This Month's

©Wide World

FIRST RIVET was driven last month in one of the columns of the $22,000,000, 45-story New Yorker Hotel. Mack Kanner, builder, is the man behind the "gun."

LOCK CHAMBER, 56 ft. wide and 360 ft. long, on Ohio River, completed by U.G.I. Contracting Co. for Army Engineers at Deadman Island, near Pittsburgh.



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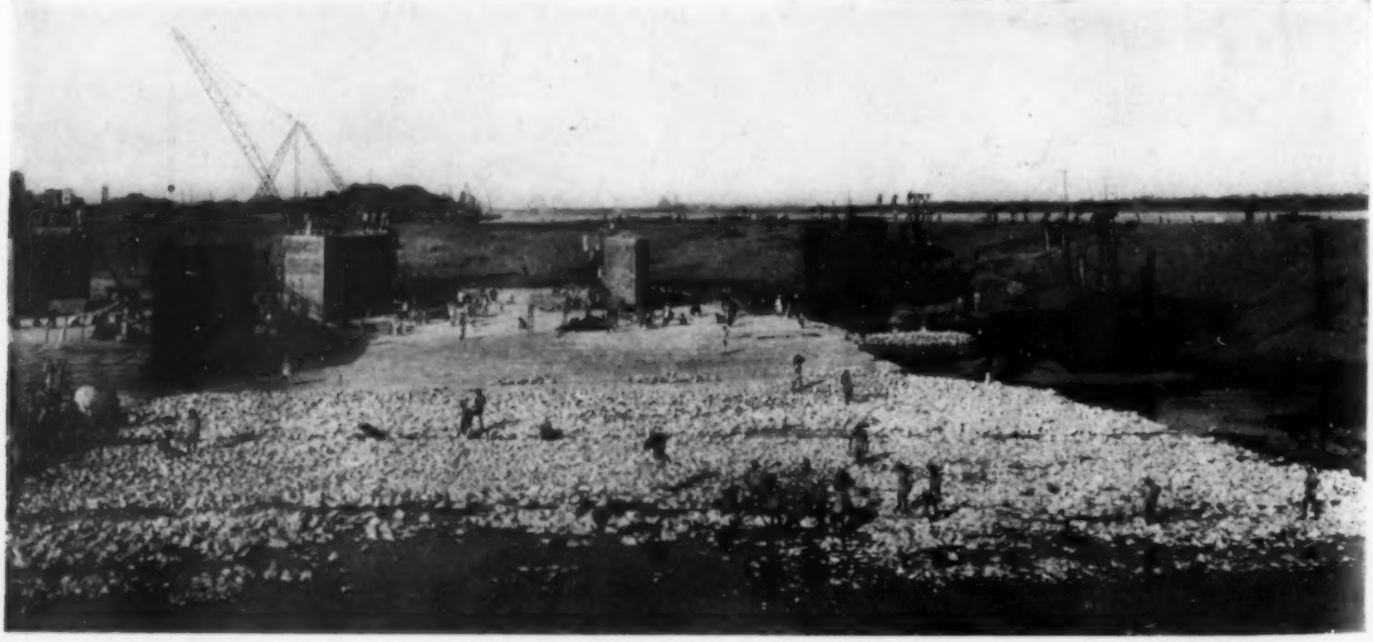
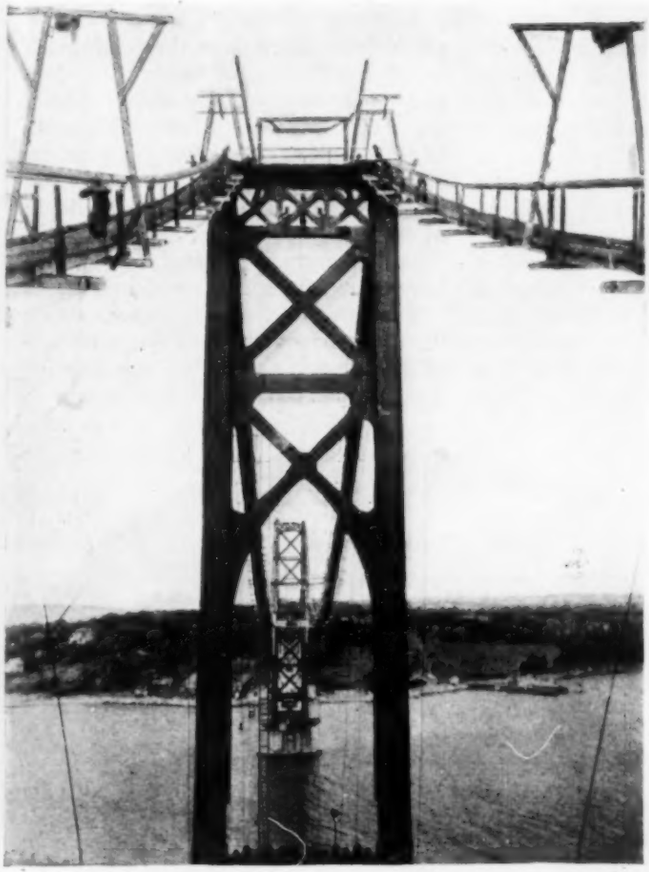
LONGEST HIGHWAY BRIDGE. Structure extending 5¼ miles across James River at Newport News, Va., has been built by Turner Construction Co. and Raymond Concrete Pile Co. to close gap in Atlantic Coastal Highway.



BUILDING LLOYD BARRAGE, part of project for irrigating 6,000,000 acres of land in India. Construction methods involve use of modern machinery and primitive native labor at 50 cents a day.

Photo from
H. J. AJWANI
Asst. Engr. Lloyd Barrage Scheme,
Larkana, Sind, India.

"News Reel"



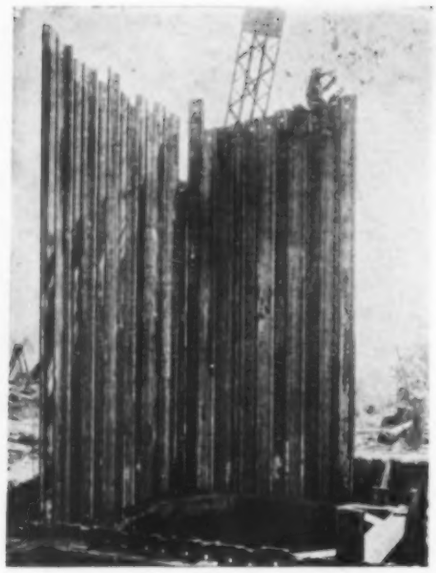
CABLE SPAN, 1,200 ft. long, links 285-ft. towers for Mt. Hope bridge between Bristol and Portsmouth, R. I., McClintic-Marshall Co., general contractor. Keystone State Corp. and American Cable Co., cable construction.

SUBAQUEOUS HIGHWAY completed to carry vehicular traffic under estuary between Oakland and Alameda, Calif. It was built in 203-ft. precast concrete sections, floated to place and sunk in water up to 90 ft. deep. Outside diameter of tube, 37 ft. and roadway width 24 ft. Contractor, California Bridge & Tunnel Co.

A 450-FT. CELLULAR ARCH of concrete, the Pont de la Caille, has been completed to span the 480-ft. gorge between Annecy and Geneva in the south of France. A feature of the construction was the support of all falsework by cable.

Speedy Pile Pulling

Device plays big part



SHEETED SUMPS, equipped with pumps, were located at intervals of about 1,000 ft. along the line of the sewer trench

"THEY walk right out of the ground when we use this rig," said Robert Petersen, local manager for the Henry W. Horst Co. on the construction of the large concrete, tile-lined Upper Delaware collecting sewer, nearing completion at Tacony, Pa., for the city of Philadelphia.

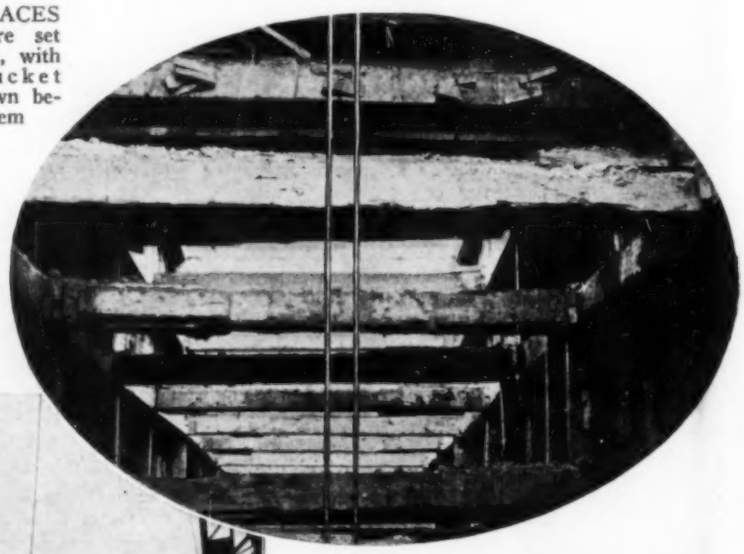
His remarks referred to a new device for pulling steel sheetpiling which he had developed on this job. The rig consists of a heavy timber mast, 42 ft. tall, equipped with six-sheave tackle blocks which provide a 13-part line to multiply the pulling power of a single cable from a standard crawler-mounted locomotive crane.

Before work was started on the two sections of the sewer project awarded to the Horst organization, involving a cost of $2,500,000, it was realized that speed in pile pulling would be a controlling factor in the progress of the whole job. Here were the conditions:

Job Conditions—A route parallel to and only 500 ft. distant in places from the Delaware River. A trench 14,000 ft. long, involving an actual excavation of 300,000 cu.yd. (mostly in earth) reaching a maximum depth of 40 ft. and an average depth of 30 ft. Trench subgrade generally 15 ft. below water level in the nearby river.

These were the main factors that led the contractor to decide upon heavy cross-bracing and solid sheeting of Lackawanna arch web steel piling in lengths from 25 to 35 ft. to exclude ground water and hold the bank from caving during the concreting of the sewer, with a cross-section varying from 10 ft. x 10 ft. 3 in. to 9x9 ft. On the two Horst contracts, a total of 4,000 tons of steel sheetpiling was employed, the practice being to keep the trench sheeted for distances of from 600 to 800 lin.ft.

CROSS-BRACES (*right*) were set every 10 ft., with clamshell bucket working down between them



AFTER FIRST TIMBERING SETS had been placed, the steel sheet piling was lined up ready for driving by steam hammer

For a trench of 30-ft. average depth, the contractor's calculations indicated a cost for steel sheetpiling of about $50 per linear foot of sewer, on the basis of 1 ton of sheeting per linear foot of trench. Obviously, after the sewer section had been concreted, any rig that could pull the sheeting quickly for use again further up the line where excavation was in progress would effect a big cut in cost.

The value of the pile puller is disclosed by the fact that it extracted, on the average, about 120 lengths of piling a day (the maximum was 172 in a day) as against only 20 lengths re-

With New Mast Rig

in rapid sewer progress

moved per day by the method, employed in the early stages of the work, of reversing a steam hammer. This result meant that the speed at the rear end of the job could be kept up with that at the front or excavating end, with the result that the contractor is completing one section of his work one year ahead and the other section six months ahead of the specified time.

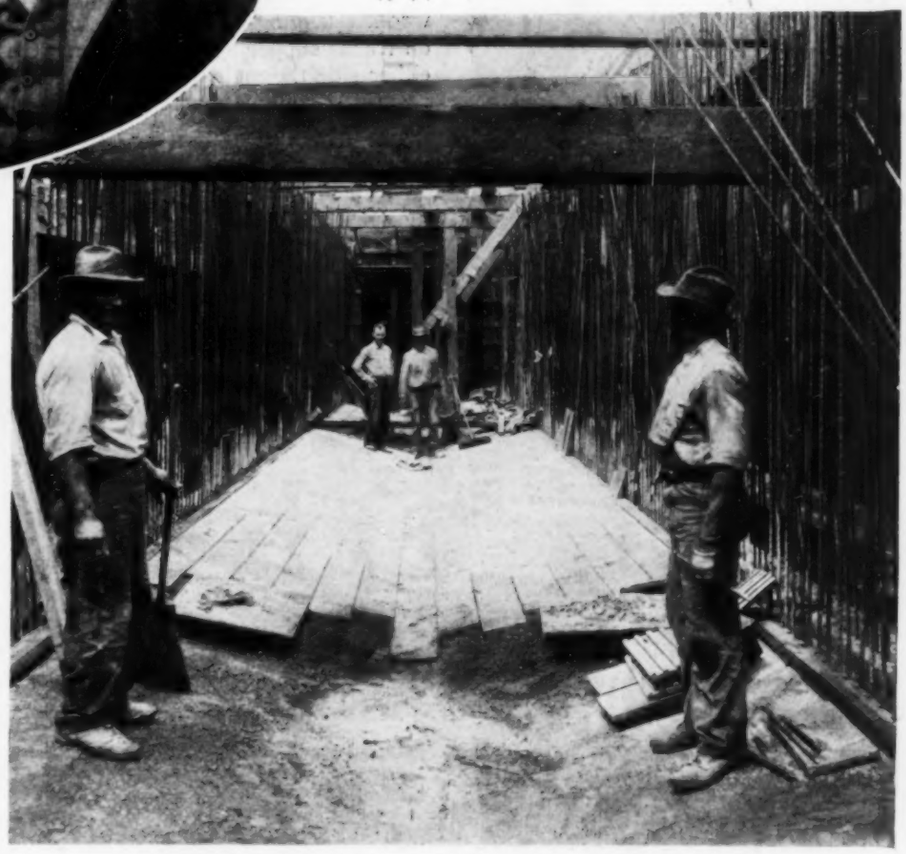
Pile Puller—A few details, supplementing the pictures on p. 9, may aid in a clearer understanding of how the pile puller operates. The mast is a 16-in. square stick 42 ft. long, with a head of riveted steel plate carrying a 400-lb. pulley block equipped with six 18-in. sheaves. A second block of the same type is shackled through a hole in the pile to be pulled. Through these two blocks 12 parts of $\frac{5}{8}$-in. Leschen flattened strand wire rope are reaved and carried down to the hoisting drum in the locomotive crane, from the boom of which the pile-pulling mast is hung.

The foot of the pile-puller mast is shod with steel plate and a pair of angle-iron guides or lugs, which prevent it from slipping off the top ends of the driven sheetpiling, on which the mast is seated preparatory to pulling. After the mast, suspended from the crane boom, is set on the piling already in place, and behind the section to be pulled, the lower tackle block is shackled to the pile to be extracted and power applied to the line from the crane hoisting drum. Multiplied many fold by the block-and-tackle rig and reacting through the vertical mast, the pull has been found sufficient to dislodge the most stubborn piles, ranging in length from 25 to 35 ft. In fact, two pile sections are often pulled simultaneously by attaching a chain from the hook on the lower block to a second pile section. The contractor has applied for patents on the device.

Excavation—For the trench excavation, after sheeted sumps had been put down about 1,000 ft. apart, the contractor employed a fleet of 8 gasoline cranes and draglines on the two contract sections. This fleet included Northwest, Koehring, P. & H. and Industrial machines. The first operation consisted in taking out the trench to a depth of 12 or 14 ft. with a dragline, then placing the upper tier of timbering and setting the steel sheetpiling along either side. McKiernan-Terry hammers then started driving the steel piles. Excavation was completed down

THE INVERT was concreted in lengths of about 150 ft. between wooden end bulkheads. Tile drain in foreground

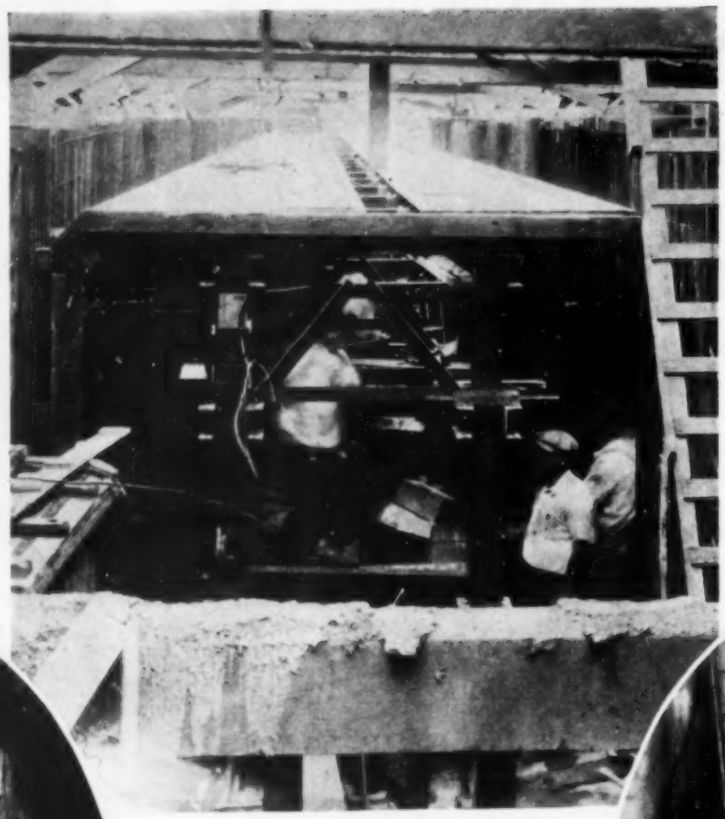
ROBERT PETERSEN (*right*) local manager, and G. M. BATEMAN, superintendent for Henry W. Horst Co.



VITRIFIED TILE LINER PLATES were laid on the invert and bedded in a 2-in. layer of 1:2 cement-sand motar to prevent erosion in completed sewer

to subgrade with Owen clamshell buckets, and the timbering and cross-bracing was carried downward in 4-ft. vertical lifts with 10-ft. intervals between cross-braces.

Concreting — The first concreting operation consisted in pouring the inverts, generally in lengths of 150 ft. between end bulkheads. For concreting the side-walls and roof of the sewer section, the contractor used on each of the two contract sections 150 ft.



WOOD LAGGING (*below*) on side wall forms through which wires from clips holding tile liner plates passed

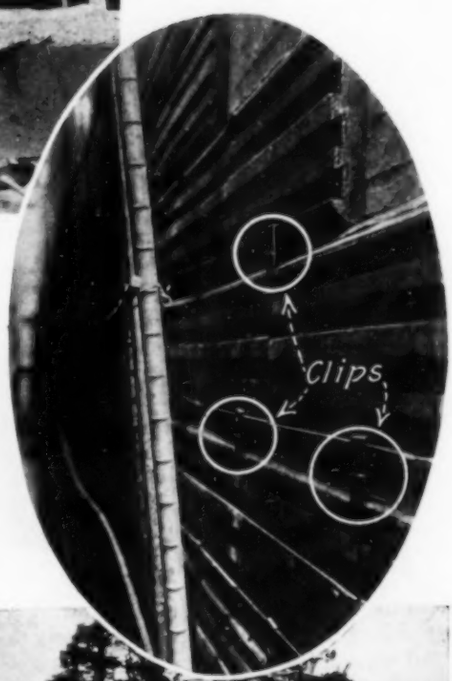
FORMS FOR SEWER (*above*) were collapsible and were supported by movable carriage. Roof forms were of steel and side forms lagged with wood

of Blaw-Knox collapsible forms with wooden lagging on the sides, carried on tracks supported by the invert. On either side the main frame of the carriage was equipped with rows of Duff screw jacks which extended and held the timber-lagged sides of the forms to proper line. Koehring and Rex paving mixers delivered concrete by chute into the forms.

Liner Plates—A special feature of the job was the lining of the inside of the sewer with vitrified tile plates 1¼ in. thick and 9x18 in. in surface area, supplied by the Evans Pipe Co., of Uhrichsville, Ohio. These liner plates are equipped with ribbed backs to bond with the concrete.

For the invert, the liner plates were laid on a cement-mortar bedding

CLIPS (*below*) and wires held ribbed-back liner plates firmly against side forms, ready for pouring concrete



READY FOR CONCRETING. Forms and reinforcement in place. Roof and side walls were poured in one operation

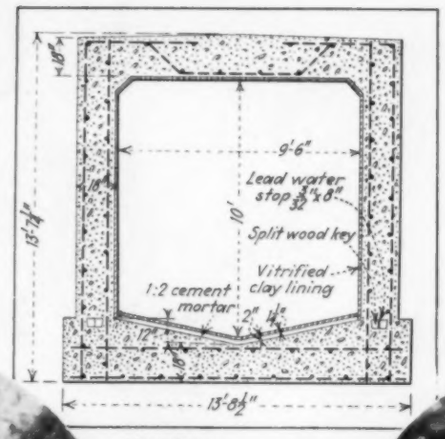
CHUTES from paving mixers delivered concrete direct to sewer forms

course 2 in. thick. For the sides, however, the liners were laid up against wood lagging on the forms to which they were held by wires and special clips, as shown in the photographs on p. 8. Thus the backs of the liner plates themselves served as forms against which the side-wall and roof concrete for the sewer was deposited.

The function of the vitrified tile liner plates is to protect the interior of the sewer from erosion and also to insulate the concrete from attack by injurious liquids or gases.

With the concreting and tile lining completed, the final operations consisted in backfilling the trench by dragline and pulling the steel sheet-piling by the methods previously described.

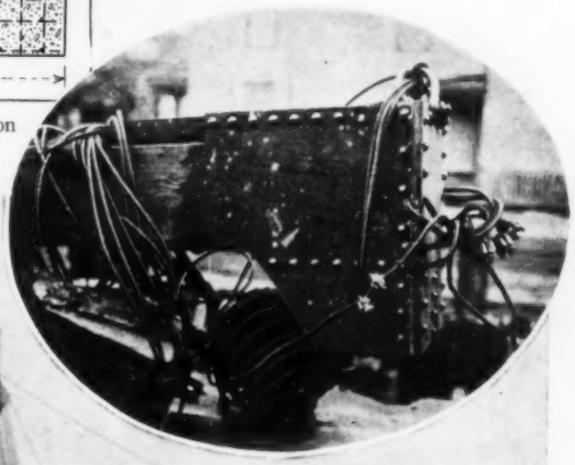
For the Henry W. Horst Co., Robert Petersen had charge of both contract sections, with G. M. Bateman and Ted Good as superintendents. The work was done under the supervision of the Bureau of Engineering and Surveys, Philadelphia, John H. Neeson, chief engineer.

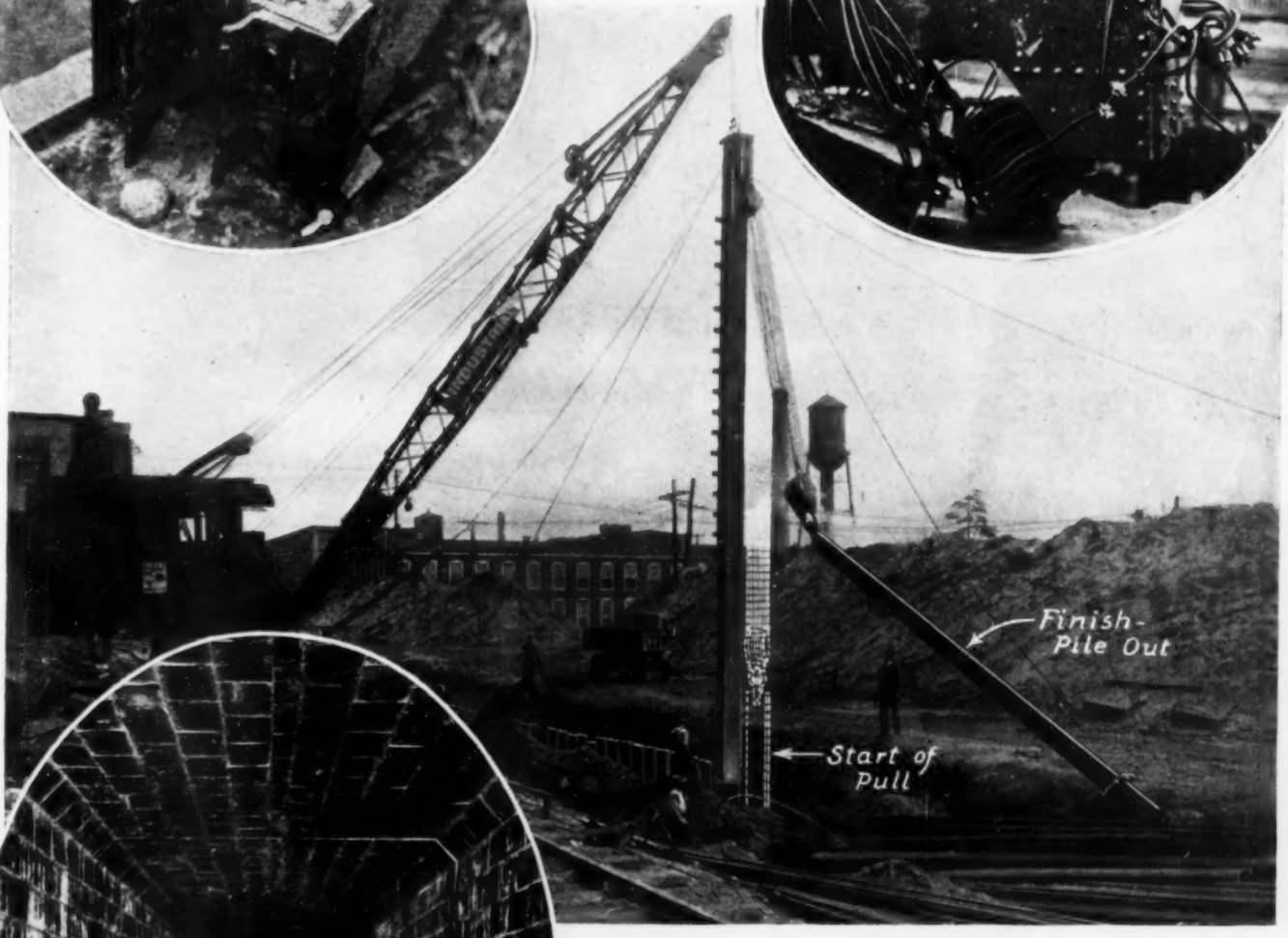


TYPICAL sewer section

FOOT OF MAST (*below*) for pile puller, showing angle-iron guides

HEAD OF MAST (*below*) on pile puller, showing 6-sheave block

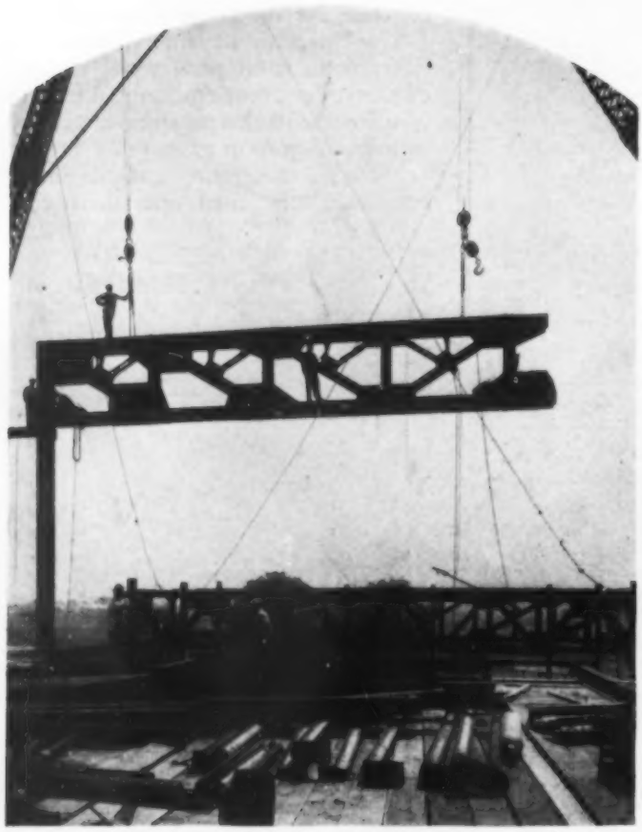


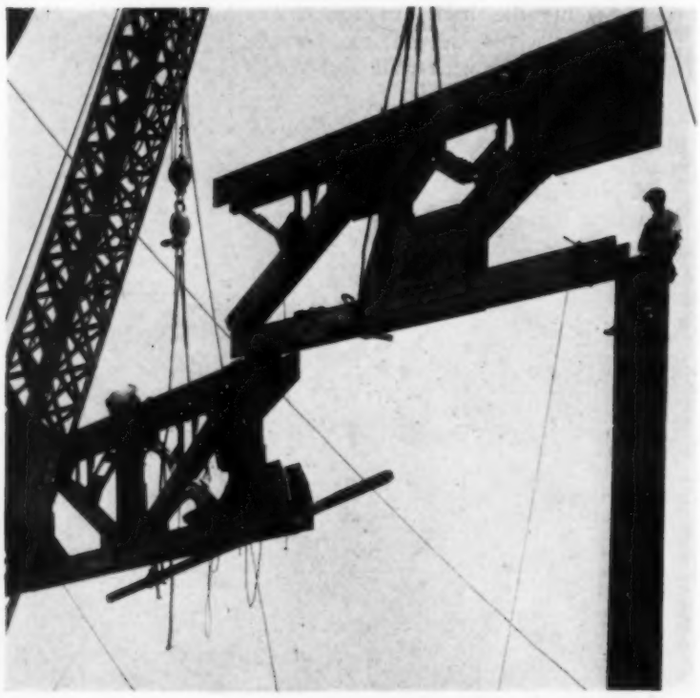


PILE PULLING RIG, which extracts sheet piling quickly with aid of 42-ft. mast, six-sheave tackle blocks and 13-part line from drum of locomotive crane

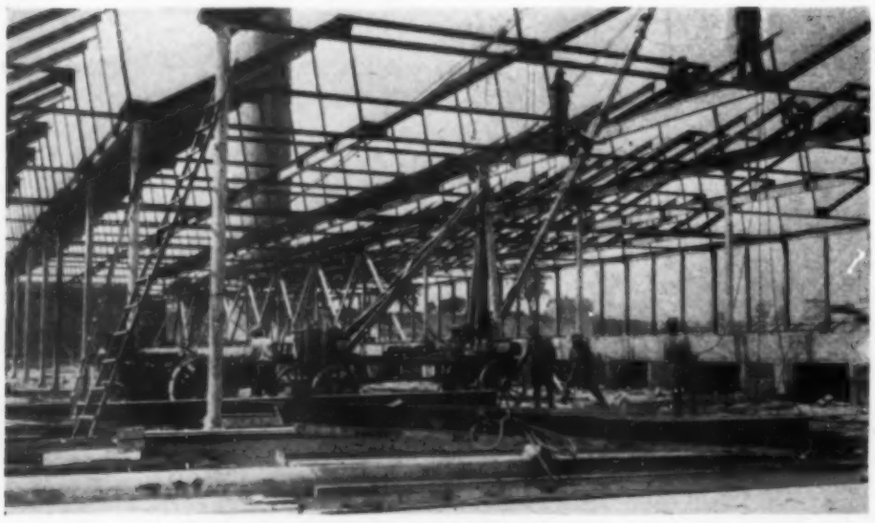
TILE LINING (*left*) in completed sewer prevents erosion and protects concrete from liquids and gases

DERRICK





TWO DERRICKS ERECT TRUSS IN SECTIONS—It was necessary on construction of Albany Law School to erect a 43-ton truss in sections in order not to exceed the safe limit of derrick capacity and also to eliminate falsework 55 ft. high. Two derricks set the first truss section, as shown in photo at left. After one end of this truss section was connected to the column, the left derrick was unhooked from the truss and rehooked to the right end of the section, as shown in photo at right, thus releasing the second derrick which then picked up and set the remaining truss section.



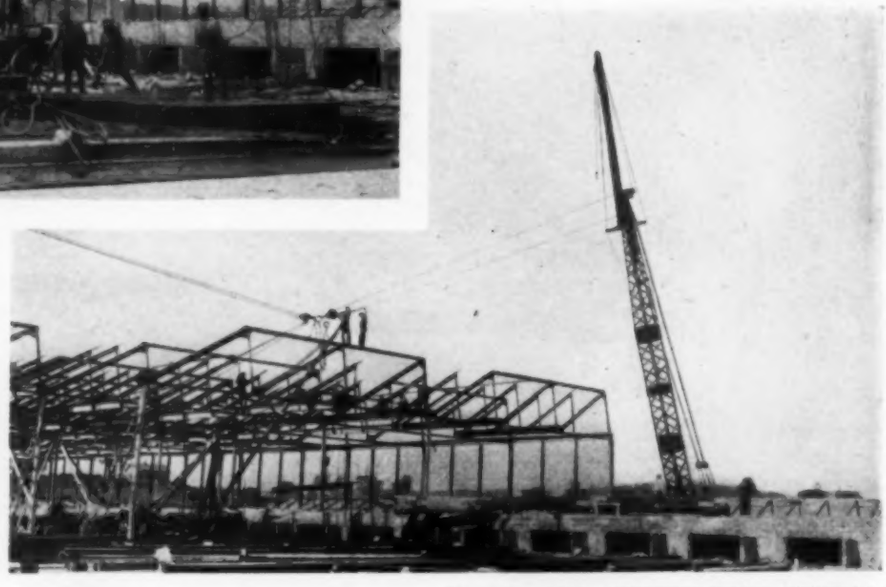
Photos on this and facing page from

Col. Elbert A. Gibbs

General Manager

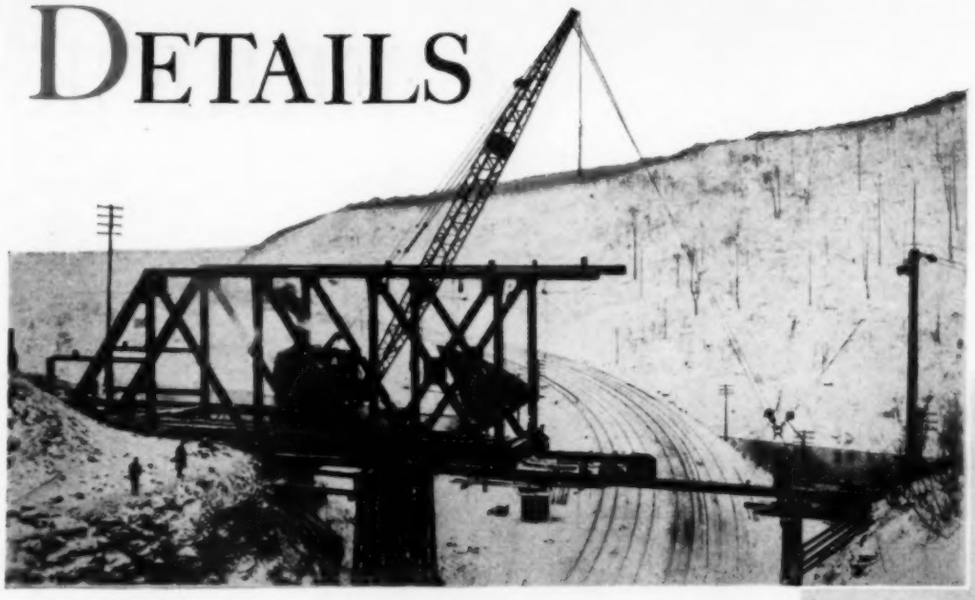
McClintic-Marshall Co., Pittsburgh, Pa.

Illustrations show diversity of derrick use on a wide range of the company's steel erection operations.

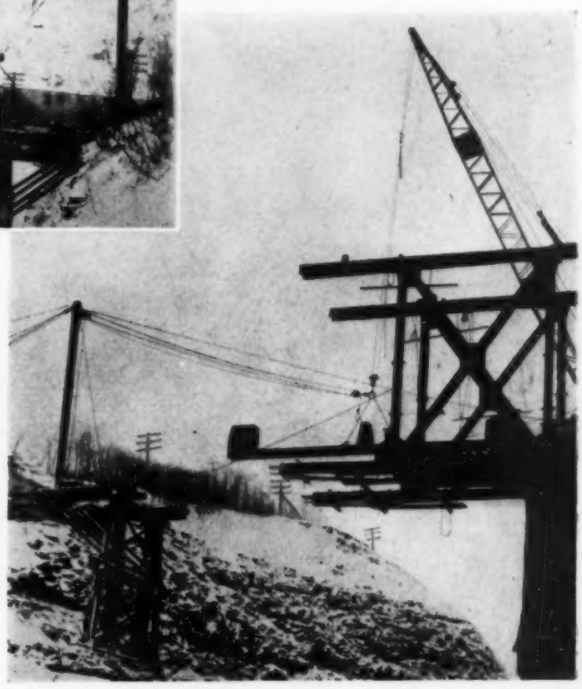


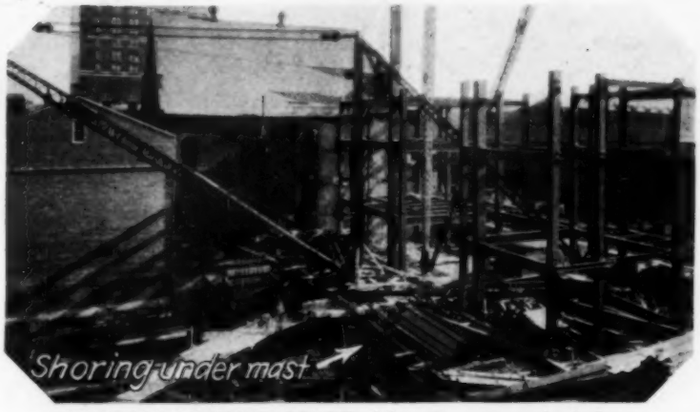
LIGHT JINNIWINK *(above and at right)* mounted on a four-wheel truck, proved useful in erecting steel work for one of the industrial buildings of the Viscose Company at Parkersburg, W. Va. Concrete floor over basement made use of any heavier rig impossible. In photo at right note supplementary operations with cables from long crane boom beyond restricted limits of floor area.

DETAILS



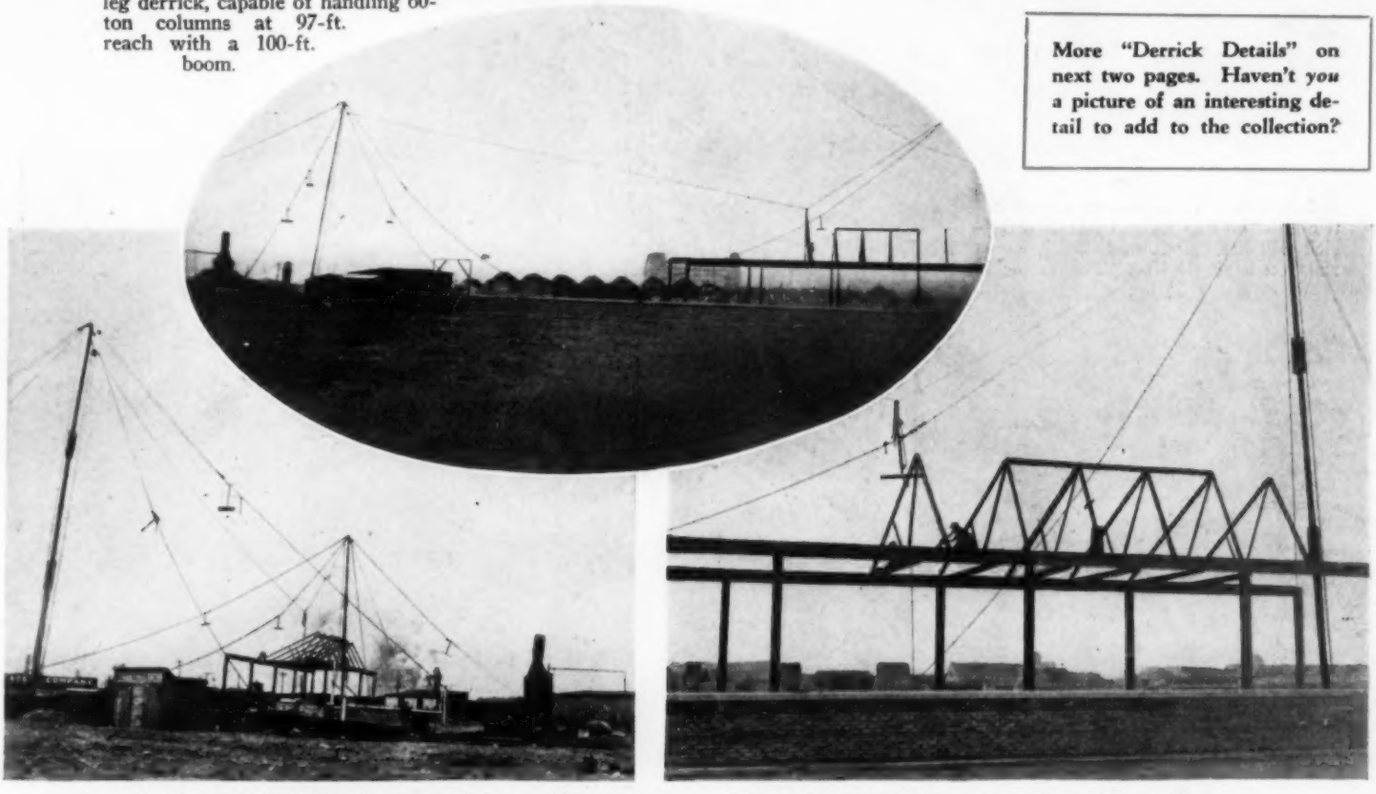
CANTILEVER METHOD *(at left and below)* was successfully employed to set steel in a truss span over four Pennsylvania Railroad tracks near Johnstown, Pa. The two photographs show how the steel was outhauled with crane and gin pole at opposite ends of the structure.





SHORING UNDER MAST *(above)* was required from first floor to basement, a distance of 55 ft., for this big stiff-leg derrick, capable of handling 60-ton columns at 97-ft. reach with a 100-ft. boom.

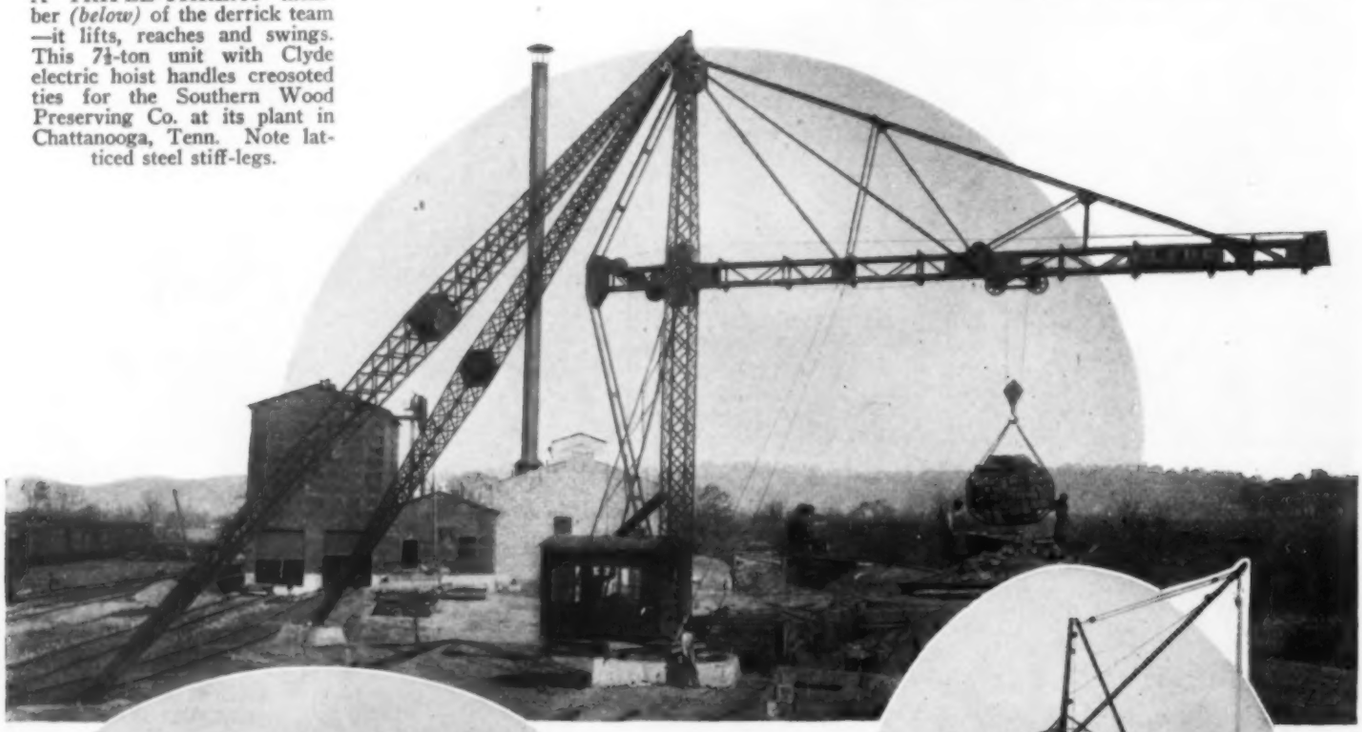
More "Derrick Details" on next two pages. Haven't *you* a picture of an interesting detail to add to the collection?



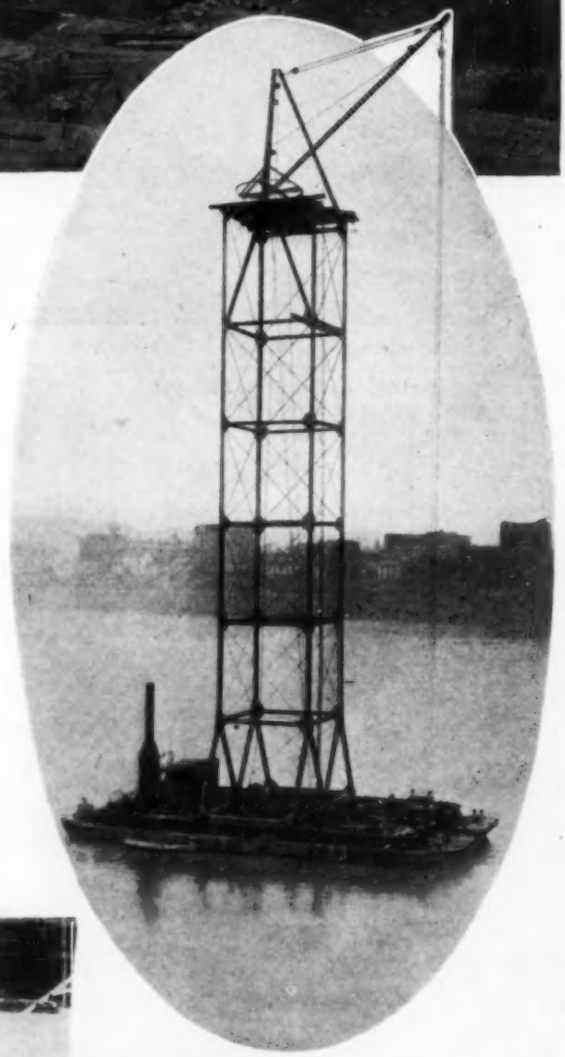
TWO GIN POLES *(in group of photos above)*, one on each side of the building, solved the problem of steel erection on a Detroit machine shop job. Material was outhauled to place with the rigs illustrated.

DERRICK

A "TRIPLE-THREAT" member *(below)* of the derrick team —it lifts, reaches and swings. This 7½-ton unit with Clyde electric hoist handles creosoted ties for the Southern Wood Preserving Co. at its plant in Chattanooga, Tenn. Note latticed steel stiff-legs.

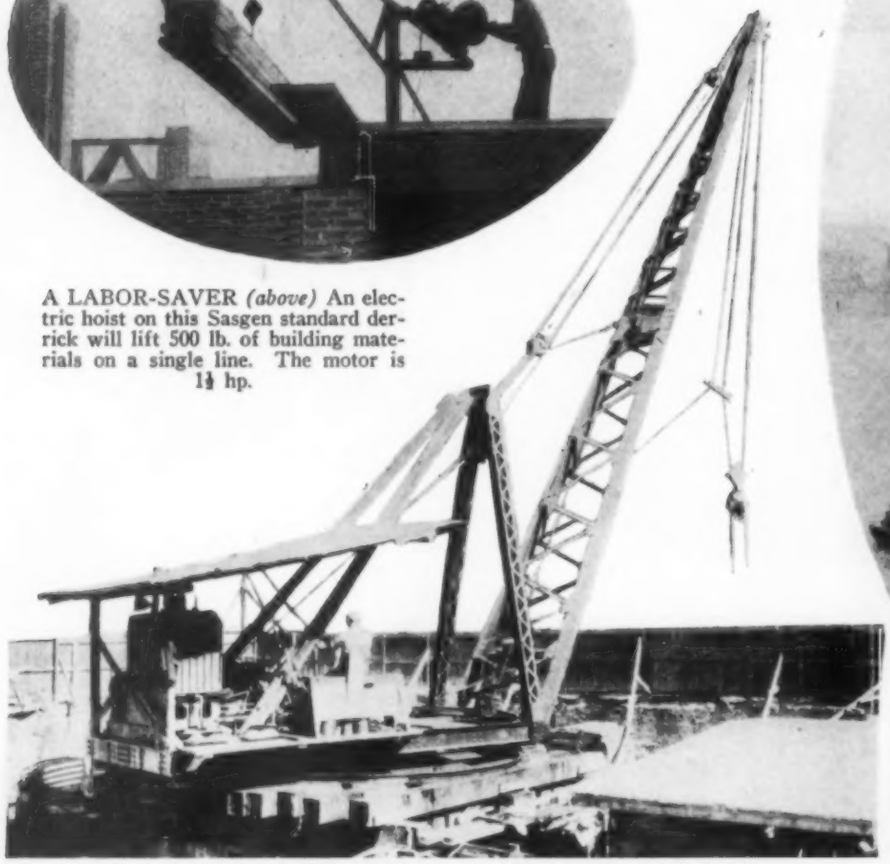


A LABOR-SAVER *(above)* An electric hoist on this Sasgen standard derrick will lift 500 lb. of building materials on a single line. The motor is 1½ hp.



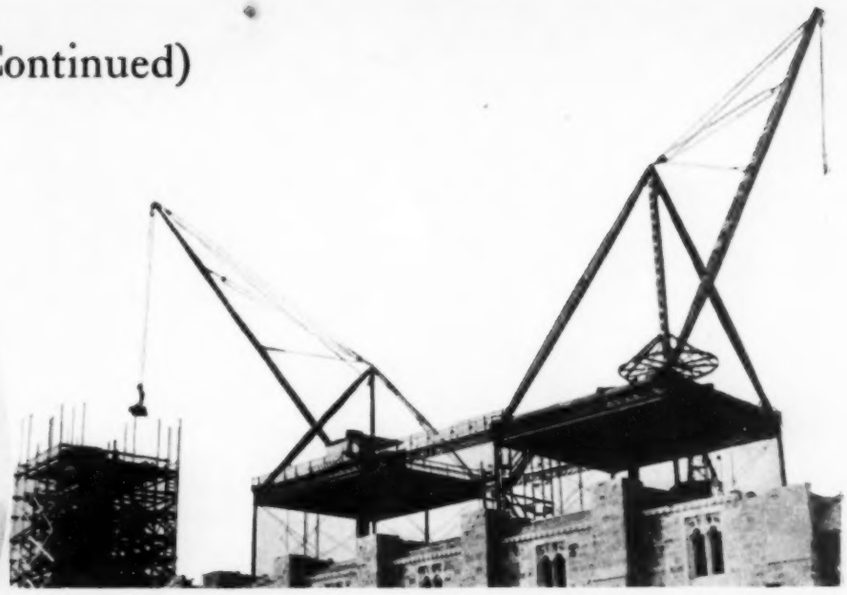
"DADDY-LONG-LEGS," A 15-ton floating unit *(above)* with 60-ft. boom on 150-ft. tower, carried by two 102-ft. steel barges. Designed and used by Dravo Contracting Co. on Ohio River bridge construction.

Photo from **H. L. HOOD** Dravo Contracting Co., Pittsburgh.



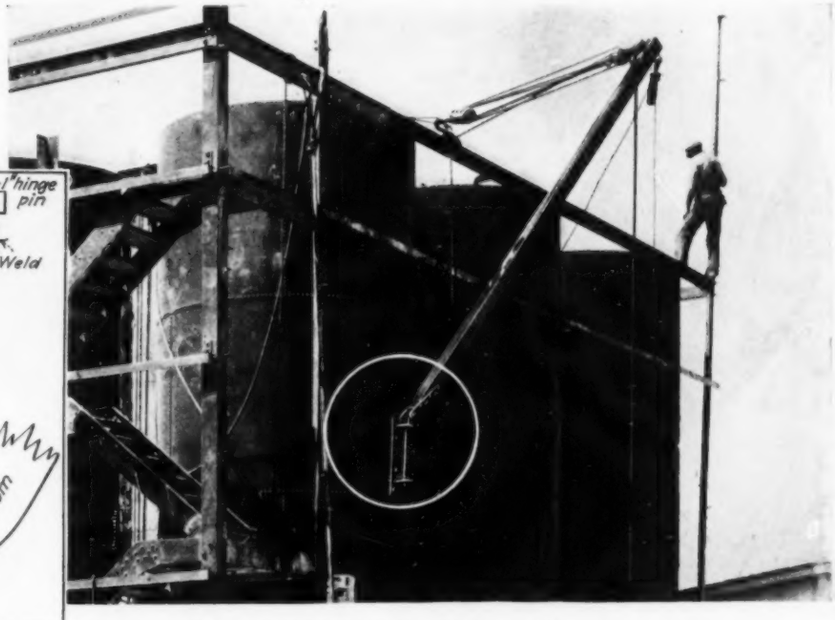
A FULL-ROTATING RIG *(above)* Here is the Mundy Hoisting Engine Co.'s latest portable Dobbie derrick, a 3-ton revolving unit weighing 9½ tons, convertible from hook to clamshell bucket work.

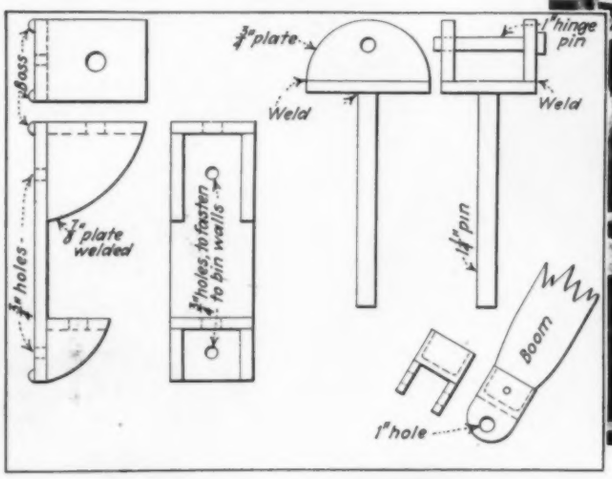
DETAILS (Continued)



STEEL TOWERS *(above)* 60 ft. high, served as a mounting for these two stiff-leg derricks, equipped with 110-ft. booms and Lidgerwood hoists. This set-up enabled Bergeron & Tattersall, contractors, to reach every point on the big Catholic Cathedral job, Toledo, Ohio.

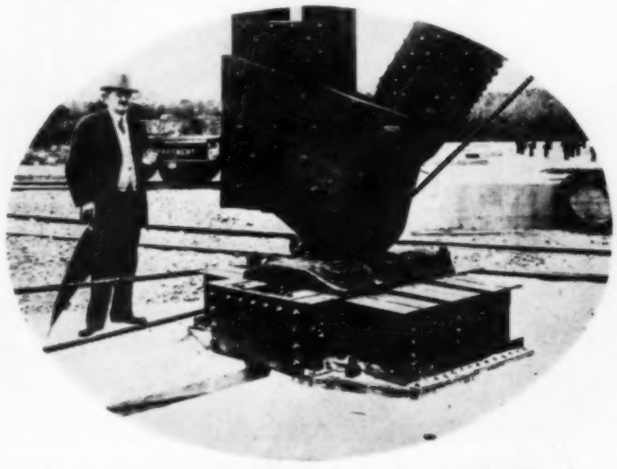
BUCKET STABILIZER *(above)* Weighted keg with cable line to clamshell prevents bucket from spinning on Hudson River bridge pier excavation by Silas Mason Co., Inc.





LIKE A BARNACLE. This special mast step for derrick boom *(in photo above and detail sketches at left)* clings to sides of steel tanks. It is shown helping erect steel gypsum bins for Schumacher Wallboard Co., Los Angeles. Can be set at any point by burning two holes in tank shell or fastened to column. Lifts load over tank top. Knuckle joint at foot of boom won't bind. Can serve places beyond reach of derrick or gin pole on ground.

Photo and Sketches from J. E. SMITH, Chief Engineer, Western Pipe & Steel Co., Los Angeles.



FOOTING DETAIL on huge 75-ton Terry & Tench derrick.

"Full many a flower is born to blush unseen,
And waste its sweetness on the desert air."

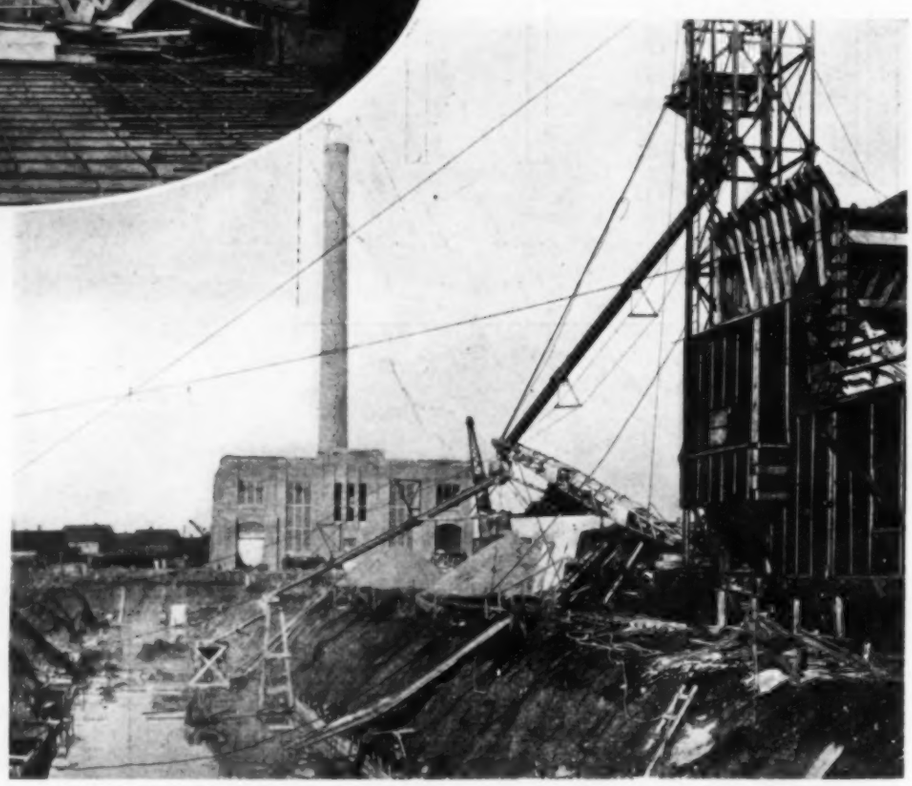
Don't **let these lines from Gray's "Elegy" apply to the Derrick Detail photos that are wasting their sweetness in your files! The Editor of *"Construction Methods"* will see to it that they won't blush unseen if they tell a job story of some interesting "kink" or novel set-up.**

Vaulted Roof for Railway Station Constructed From TUBULAR SCAFFOLD *on Rollers*

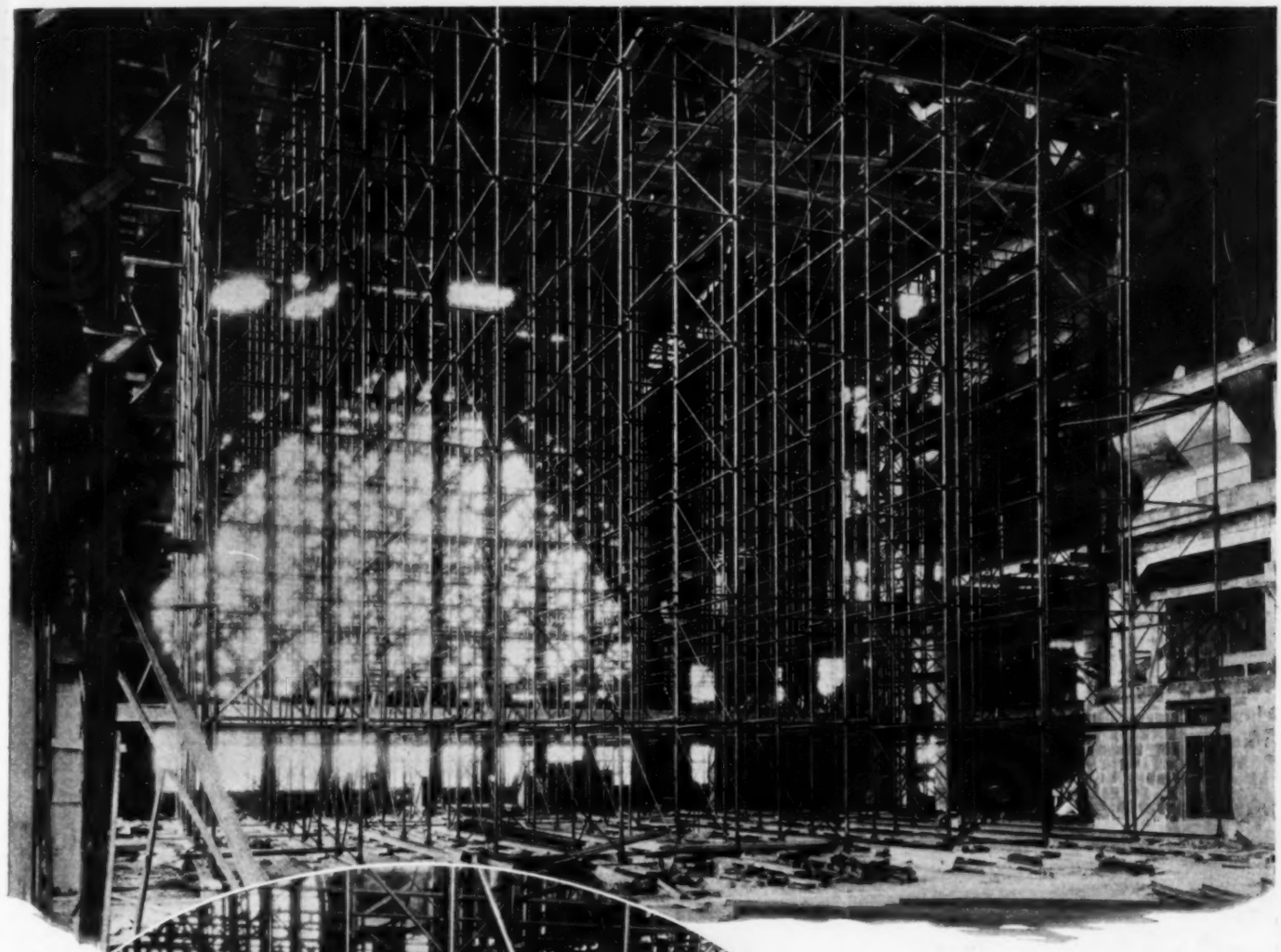
BAGGAGE SUBWAY *(above)* passed beneath three used tracks of the belt line. Two openings first were cut for the walls, the tracks shored up, and the walls constructed.

IN BUILDING a large, modern passenger station in Buffalo for the New York Central Railroad the Walsh Construction Company, of Davenport, Iowa, needed a tall rigid scaffold to support the tile in the Gustavino arch which forms the ceiling of the passenger concourse. The Wheeler-Murray Company, Buffalo agent of the Dravo Equipment Company of Pittsburgh, supplied the contractor with a tubular steel scaffold filling all requirements and the use of this scaffold, it is claimed, has contributed substantially to the speed and skill with which the job has been handled.

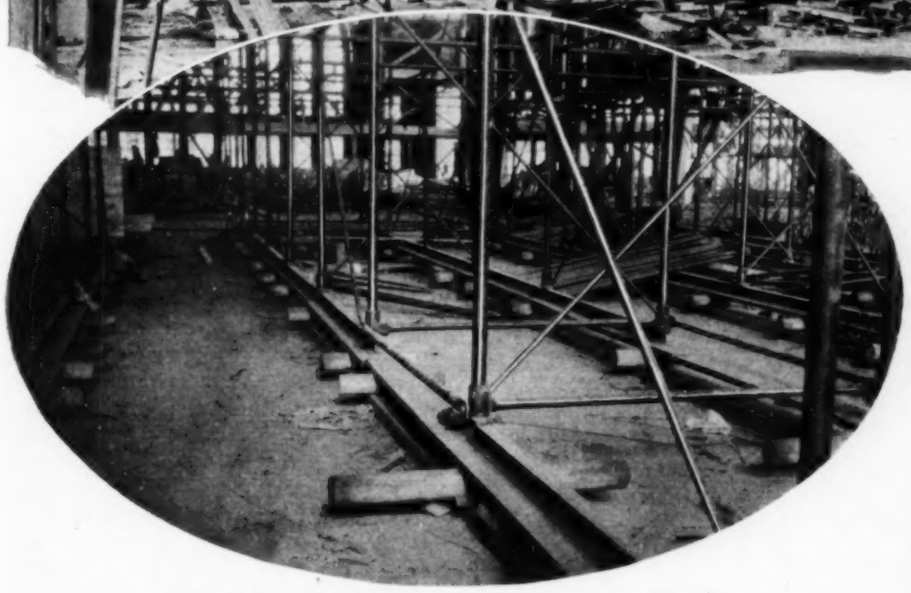
Buildings, platforms, and tracks in the general contract of the Walsh Construction Company covered an area approximately 850x1,400 ft. The main building, six stories in height and approximately 250 ft. square, has a 20-story tower, 80 ft. square, in one corner. A five-story mail and baggage building, 60x360 ft. in plan, and a train concourse, 40 ft. wide and 480 ft. long, connect with the main structure. All the buildings are of brick and steel construction, on concrete foundations. The passenger concourse is 66 ft. wide



MOVABLE CONCRETE PLANT on a flat car poured 380 ft. of the baggage subway and the ramps leading to the passenger platforms.



TUBULAR STEEL SCAFFOLD *(above)* 52 ft. high for erecting steel and tile of the Gustavino arch in the passenger concourse. Safety, ease of assembling and dismantling, and rigidity are some of its advantages.



SCAFFOLD was erected on rollers to be moved along the concourse. Long sills, laid in the direction of movement, were divided to permit the scaffold to be moved in sections.

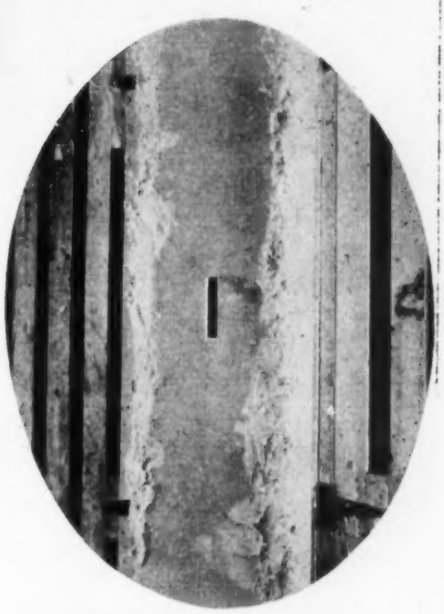
by 225 ft. long. The crown of the arch is 57 ft. 6 in. above the floor.

Ramps and steps lead from the train concourse to seven passenger platforms underneath. The platforms have a total length of 7,480 ft. Other ramps provide access from the platforms to a baggage subway beneath the tracks. The subway extends 660 ft. beyond the main building.

Materials—The total quantities of materials required for the construction of the passenger station were approximately as follows:

Excavation	100,000 cu.yd.
Concrete	80,000 cu.yd.
Common brick	7,500,000
Face brick	2,225,000
Structural steel	12,000 tons
Reinforcing steel	750 tons

Both the main line and the Buffalo belt line of the New York Central Railroad touch the site of the station. Ma-



PLASTER OF PARIS with excelsior filler was used to protect exposed edges of marble during construction.

terial tracks were laid from the belt line into the basement of the buildings, as the plan on p. 17 shows, and concrete plants and towers were erected at convenient locations. Two spurs from the main line were placed parallel with the train concourse.

Tubular Scaffold—The scaffold used in supporting the tile in the arch during construction was made up of standard light American Tubular Elevator Co. towers connected by horizontal struts to form a rigid structure. The photographs of the scaffold show the arrangement of towers and cross-struts. Each tower was 6 ft. 4 in.x8 ft. in plan. The towers were erected lengthwise, 8 ft. apart, in rows spaced 6 ft. 4 in. apart. The scaffold was built entirely of the three standard members used in the light tubular tower. The legs were heavy 2-in. steel pipe, and the girts and diagonal braces were, respectively, 1½ in. and ¾-in. steel pipe. All connections were bolted.

One change from the usual tower construction was made in the sills. The scaffold was intended to be rolled along the concourse and was erected on wood rollers for this purpose. Instead of the four channels ordinarily placed under each tower, two continuous sills were used under each row of towers to permit movement on the rollers. The long sills were divided, as one of the photographs shows, to allow the scaffold to be moved in sections.

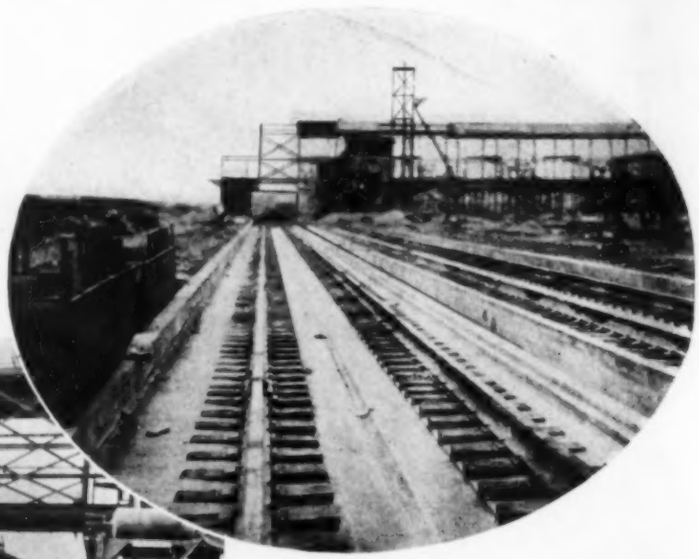
Extra long girts had to be used to connect the main scaffold with the scaffolding in the bays. Where connections for more than three girts had to be made, these cross-struts were clamped to the horizontal girts of the tower. The sleeves at the joints of the legs provide connections for no more than three girts.

The structure served as a means of erecting both the steel and the tile for the Gustavino arch. Although the members composing the scaffold could be used to erect standard light tubular materials towers, R. K. Eilenberger, superintendent for the Walsh Company, could foresee no permanent need for this quantity of tower material, and he leased the scaffold, instead of purchasing it, from the Dravo Equipment Company.

The tubular steel scaffold is said to possess a number of advantages over the ordinary wood structure. It made erection and dismantling easier, eliminated the fire hazard, admitted more light, and provided the strength and rigidity necessary for constructing a tile arch. One of the towers was rigged as a hoist by adding a cathead and guides. A scaffold of this type can be built to any length, height, and shape by the use of standard length and adjustable length members. The scaffold was partially dismantled and reassembled to be used in the long train concourse. Light tubular towers can be erected for individual use to a height of 130 ft. A heavy tower of the same type is designed for greater heights. Heavy towers have been used up to 611 ft.

Concrete Plant—A movable concrete plant consisting of a mixer, bins, and tower erected on a flat car poured the 380 ft. of baggage subway and the ramps beneath the passenger platforms. Tracks were laid for this purpose. The movable plant proved an efficient piece of equipment for this kind of work, where a track could be placed beside a long structure.

At one place, the baggage tunnel passes beneath the three tracks of the belt line. These tracks were in constant use during construction of the tunnel. The method employed in putting the subway under the belt line was first to cut two openings for the walls and to shore up the tracks. After the walls had been built, the top of the rock core was removed to permit construction of the roof. As a final operation, the rest of the rock was excavated to grade and the floor of the tunnel was poured.



TRACKS between platforms were spiked to short timber ties set in heavy reinforced concrete foundations.

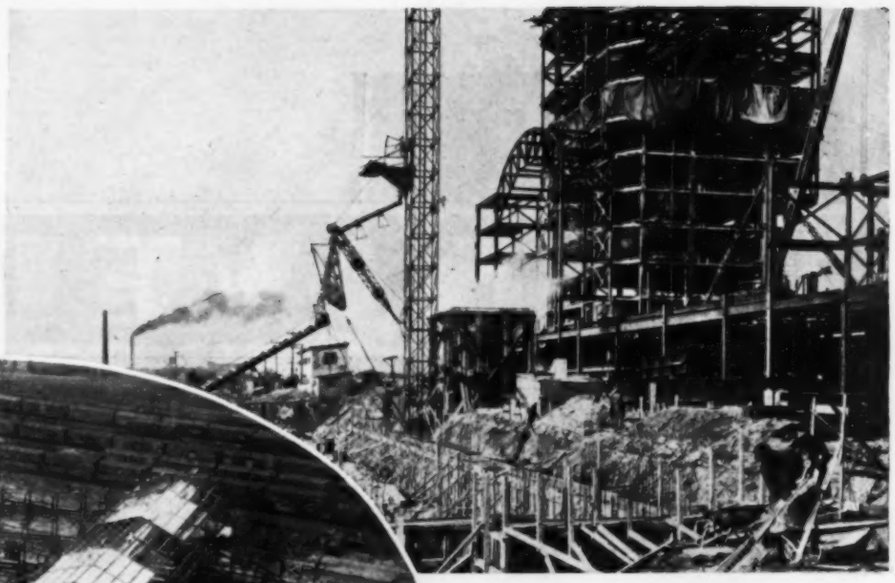
PORTABLE MIXERS were moved along the platforms to pour the bases. Each mixer was fed by wheelbarrow from cars on the other side of the platform.

Track Foundations — Uncommonly heavy foundations were provided for the tracks between the passenger platforms. The rails were spiked to short timber ties set in a reinforced concrete base. Each track rests on a slab 22 in. thick at the edge and 17 in. thick at the drain in the center. The contractor put in 14,960 ft. of this type of track.

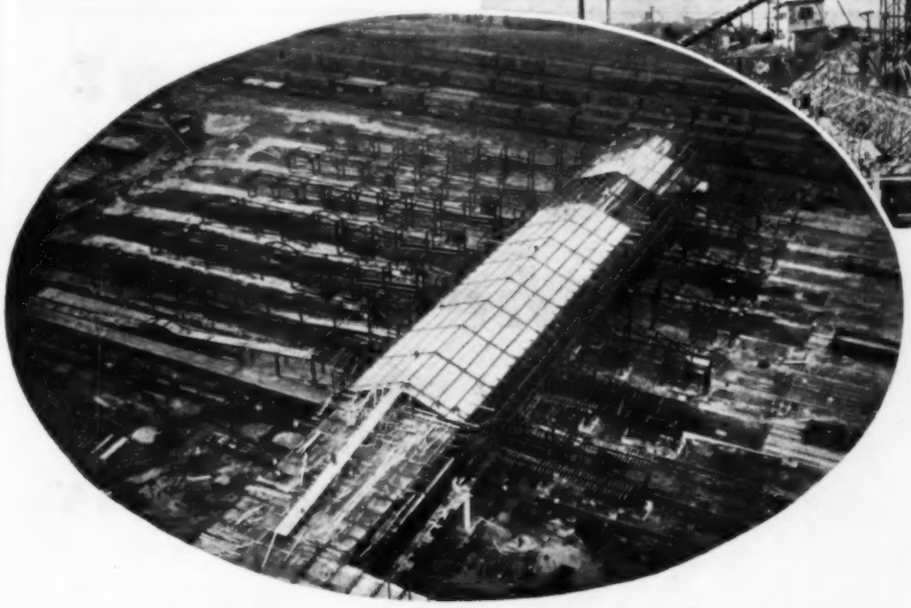
The photographs illustrate clearly the method of construction. After careful preparation of the subgrade, reinforcing steel was placed, and the rails and ties were supported at grade by concrete blocks and were held in alignment by spreaders. Portable ½-yd. mixers were moved along the platforms to pour the concrete bases. Each mixer was fed by wheelbarrow from cars

on the other side of the platform.

In addition to the Walsh Construction Company's operations the platform work and concrete track construction was handled by the John Johnson Construction Company under an independent contract. Structural steel fabrication was by the Bethlehem Steel Company and erection by the Overland Construction Company of Chicago. All of the track work was done by the maintenance forces of the railroad.

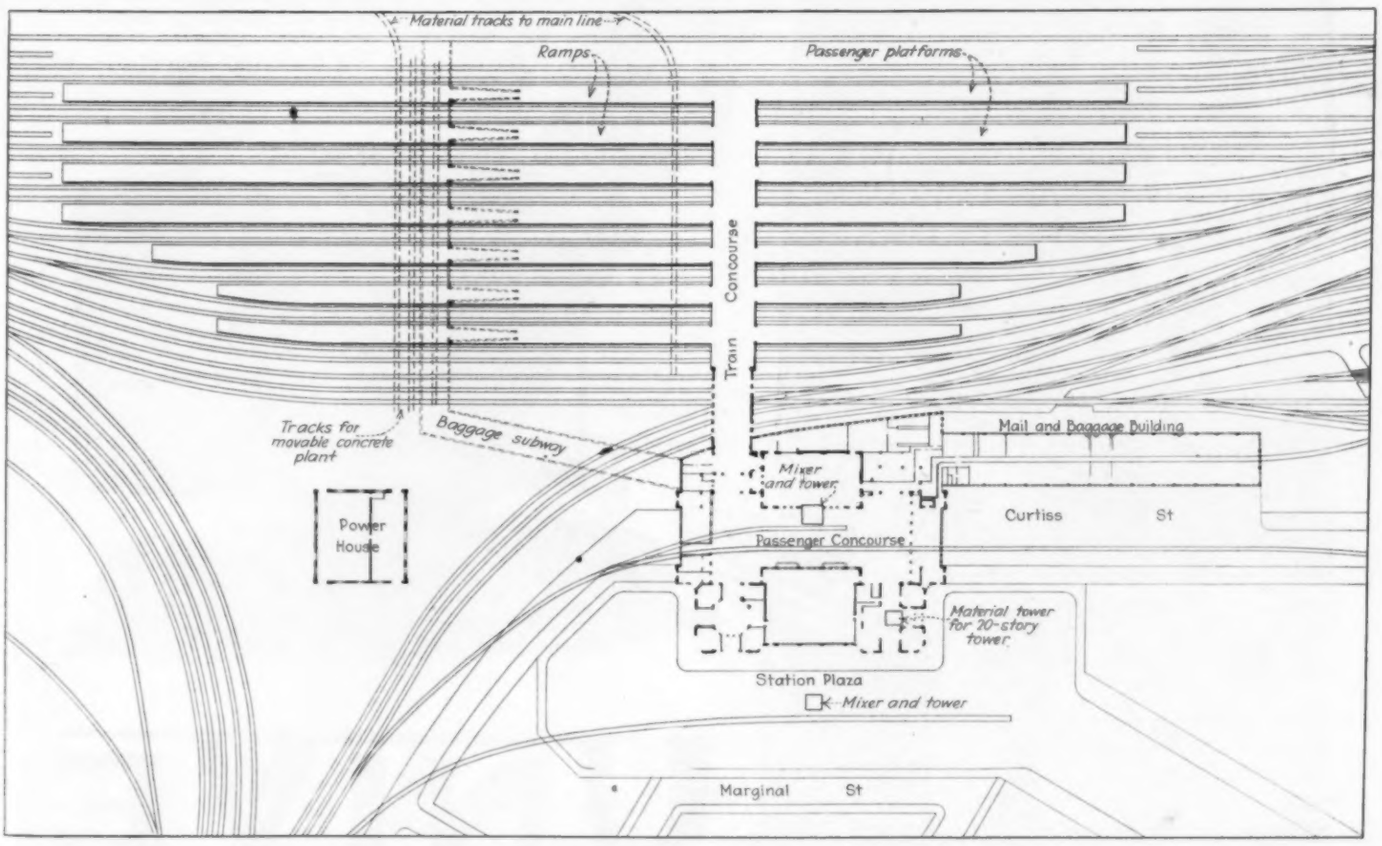


MIXERS AND TOWERS were placed at convenient locations, served by material tracks laid in the basement of the buildings. Main tower structure at the right.



TRAIN CONCOURSE, with platform ramps and stairways, under construction.

Alfred Fellheimer & Stewart Wagner of New York City were the architects for the station. Engineering and construction were directed by F. B. Freeman, chief engineer of the New York Central Railroad (Buffalo and East). W. F. Jordan, principal assistant engineer, Buffalo, was in immediate charge of all operations.



PLAN OF STATION LAYOUT, showing location of material tracks and most important concrete plants and towers. All station tracks adjacent to platforms are laid on concrete base.

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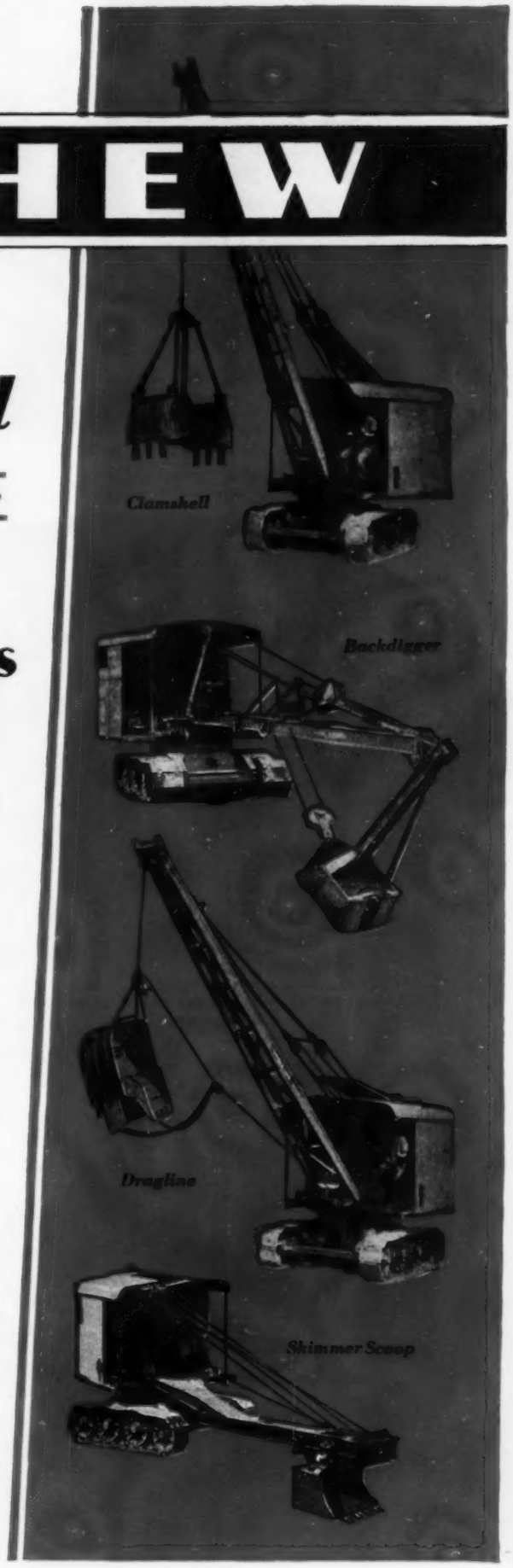
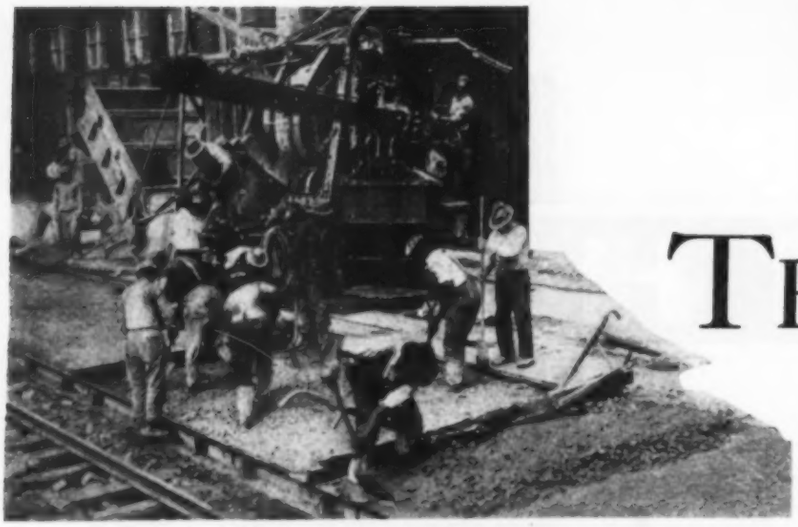


RSAL-35

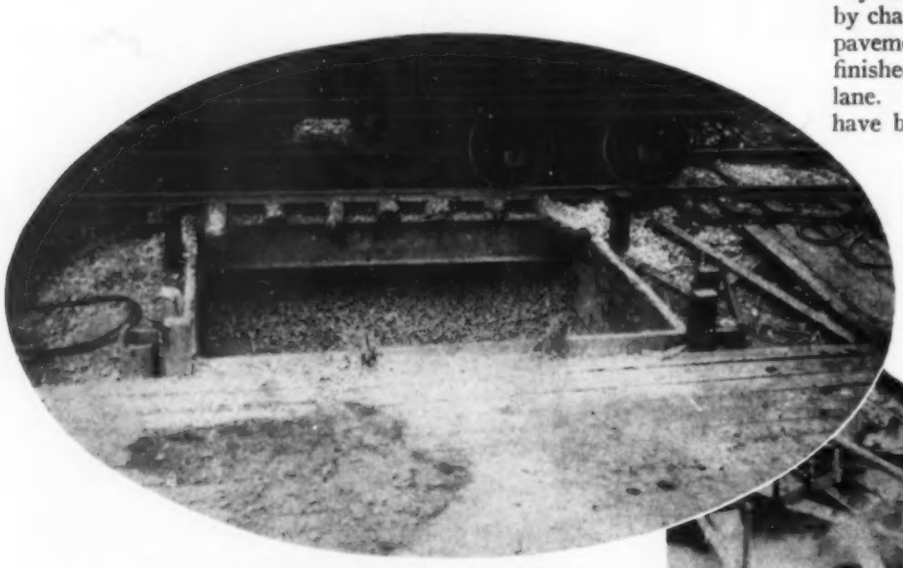
PLANNING *Speeds Up* THREE-LANE



STRIKE-OFF BOARD resting on forms and finished slab leveled concrete to 5-in. thickness for placing mesh reinforcement. Three-batch trucks hauled to the mixer

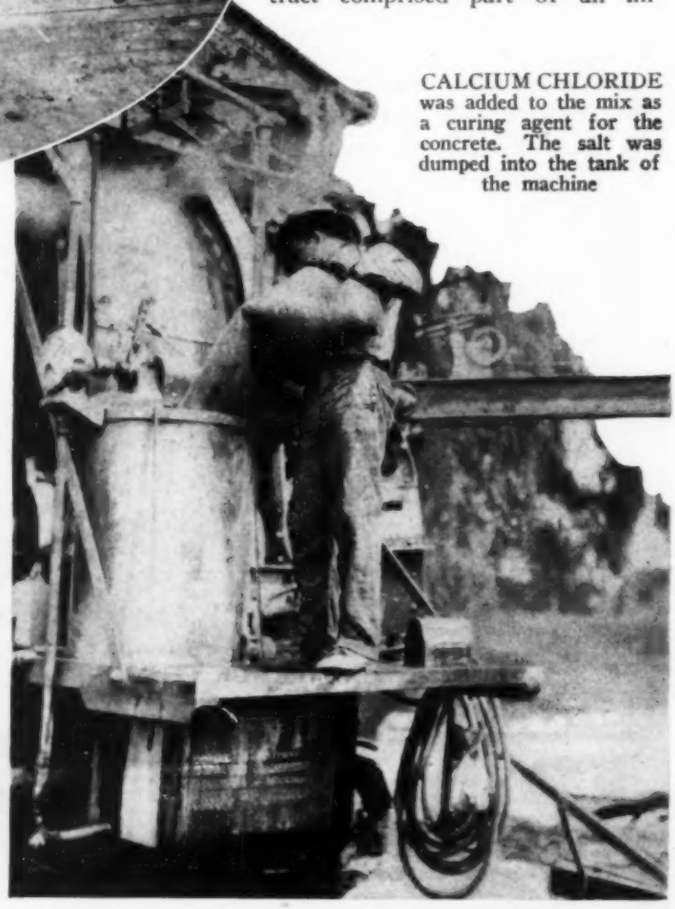
IN LAYING a concrete pavement 30 ft. wide for the Pennsylvania State Highway Department at Harmarville, Pa., R. C. Simmers, superintendent for the contractor, McCrady Brothers Company of Braddock, Pa., saved time by placing and finishing two 10-ft. strips in one operation. His Lakewood finishing machine could be adjusted to any width from 10 to 30 ft. by changing the trusses, screed, and belt. A pavement 30 ft. wide could have been finished practically as fast as one 10-ft. lane. The 30-ft. machine, however, would have been excessively heavy for the forms to carry. A better plan, therefore, was to build the pavement in two operations, two 10-ft. strips being laid and finished on the first trip of the paving outfit. In laying the third strip, mixer and trucks traveled over the completed slab.

The McCrady Brothers' contract comprised part of an im-

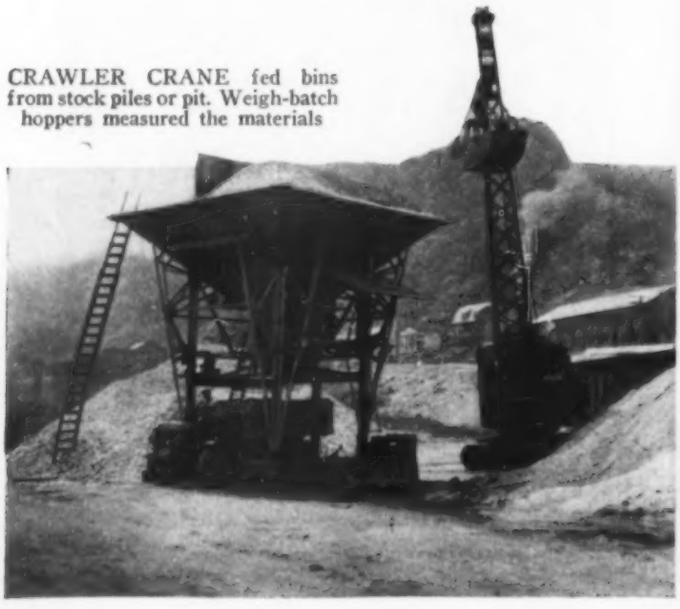


PIT of 50 ton-capacity enabled full hopper-bottom car of crushed limestone to be unloaded at one time

CALCIUM CHLORIDE was added to the mix as a curing agent for the concrete. The salt was dumped into the tank of the machine



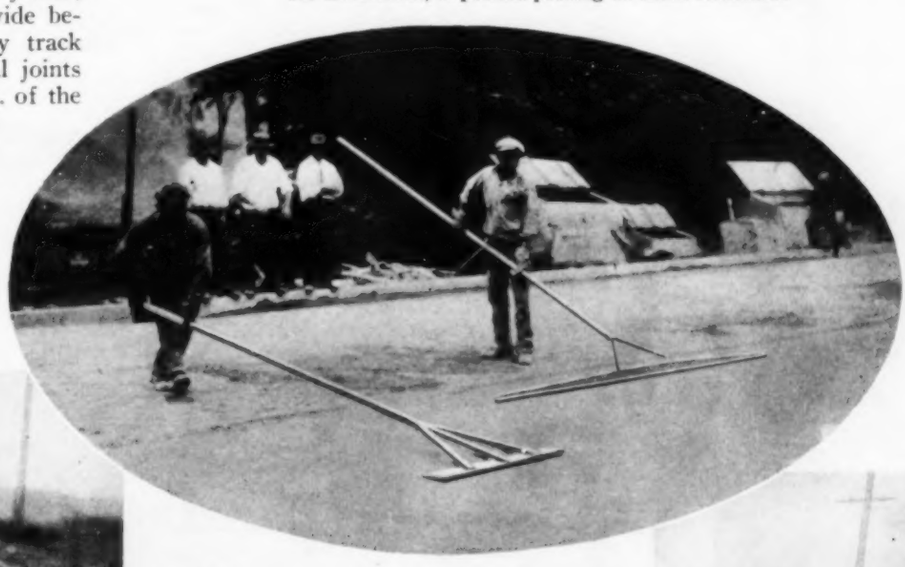
CRAWLER CRANE fed bins from stock piles or pit. Weigh-batch hoppers measured the materials



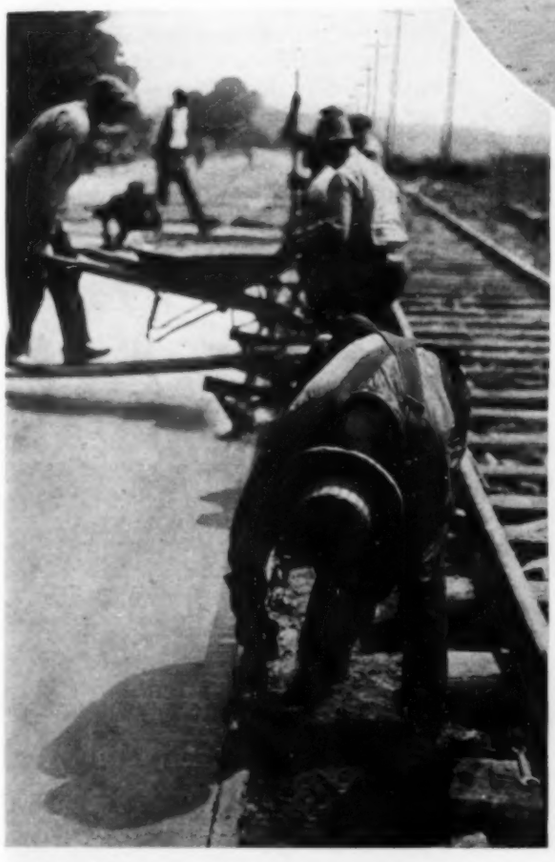
PLUS PLANT *Laying of* PAVEMENT

SMALL PAVER, a 7-E Koehring, with chain drive to rear wheel for locomotion, expedited pouring of small structures

provement undertaken by the state highway department in widening and repaving the road along the west bank of the Allegheny River north of Pittsburgh. In the contract length of 13,900 ft. were 17,000 yd. of cut and 36,000 yd. of fill; 11,800 ft. of pavement with a width inside curbs of 30 ft., divided into 10-ft. strips by longitudinal construction joints; and 2,100 ft. of pavement 38 ft. wide between curbs, with a street railway track down the center and no longitudinal joints in the slab. Approximately 7,000 ft. of the pavement had the curb on one side only. The slab was 7 in. thick with 65-lb. wire mesh reinforcement



HAND FLOATING (*right*) and checking with 10-ft. straight-edge to obtain a smooth surface



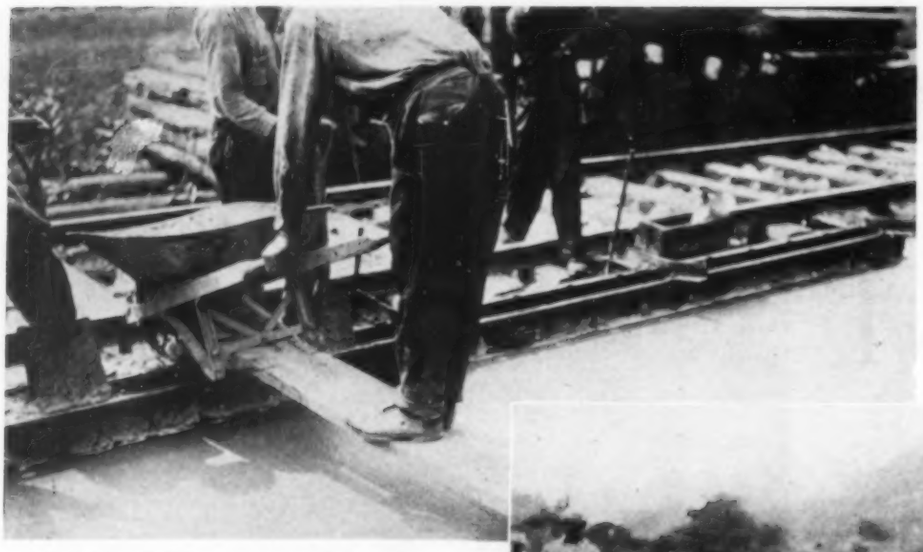
FORMS for the integral curb were erected as soon as the surface of the slab had been finished

2 in. beneath the surface. Where the 7-in. integral curb was omitted, the edge of the slab was thickened to 9 in.

A Pennsylvania Railroad branch parallels the road. The material-handling plant was located on a siding near the south end of the job, where the road crosses Deer Creek. Sand was delivered to the creek in barges and was stocked in a pile by the batching plant. Crushed limestone was the coarse aggregate used. This material was received in hopper cars and was dumped into a pit of 50-ton capacity beneath the track. An Erie steam crane operating a Blaw-Knox 1-yd. clamshell bucket fed the overhead batch bins from stock piles or pit. The job was a 35-minute haul by loaded truck from the cement plant at Universal. Because of the proximity of the source of supply, it was necessary to stock only about 2,600 sacks of cement in advance.

The Blaw-Knox overhead bins were fitted with Blaw-Knox weigh-batch hoppers, the scales being equipped with the standard dials to register the last 200 lb.

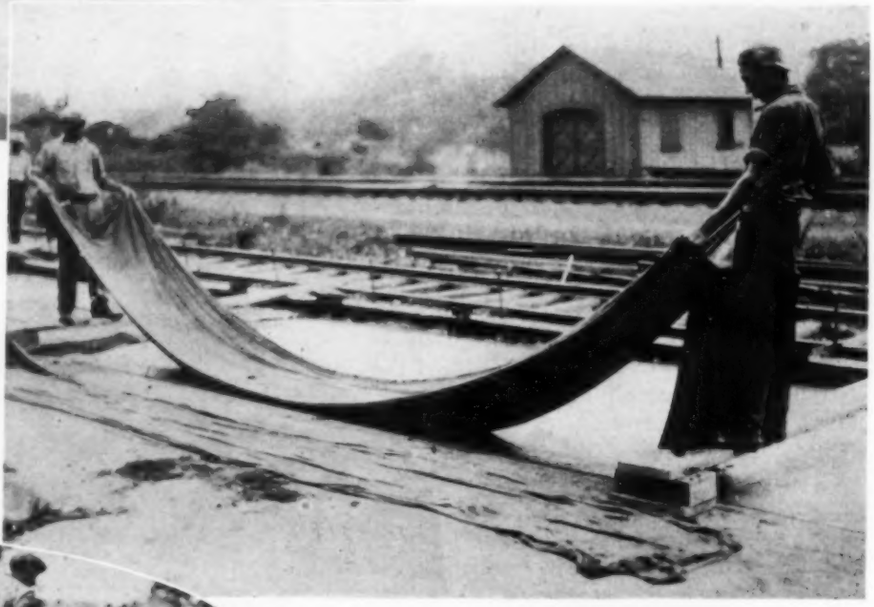
R. C. SIMMERS, superintendent, McCrady Bros.



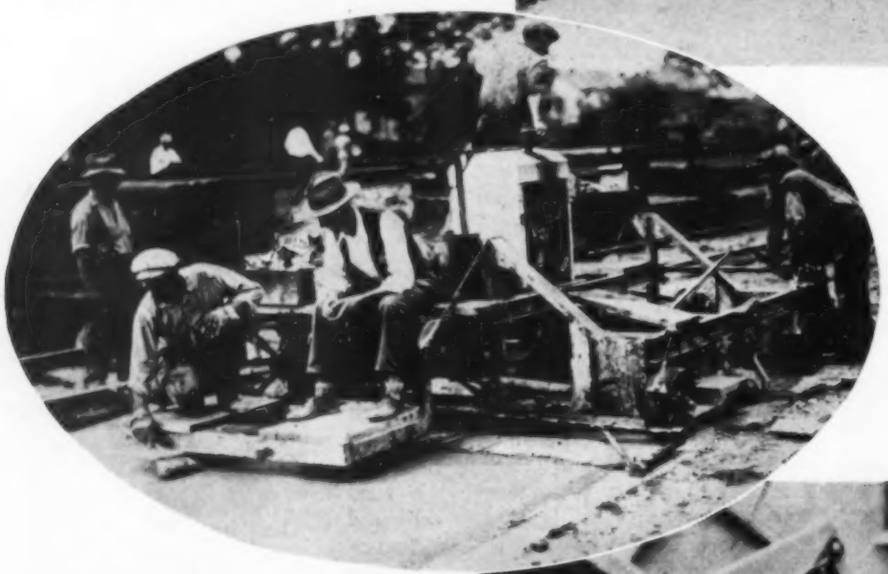
CURB FORMS were simple and strong, making curb construction an easy matter

of the batch. Hauling to the mixer was done with hired trucks. For the maximum haul of two miles, seven 3-batch trucks were used.

To supply material for the fills, two borrow pits were opened by a Koehring gasoline shovel. The fills were bulldozed with a tractor, finished by hand, and rolled. Two rollers, a 16-ton Buffalo-Springfield and a 10-ton Huber were used with an Adams 8-ft. blade



SURFACE of green slab (*below*) was covered with burlap kept wet for 24 hours, the only curing treatment needed in addition to the calcium chloride admixture



PLATFORM on rear of finishing machine aided brushing of the slab and splitting and edging of centerline joint when two 10-ft. lanes were laid in one operation

on the subgrade. The fine grade was checked with a scratch templet, as required by specifications.

Calcium chloride was added to the mix. The green concrete was covered with burlap kept wet for 24 hours. This was the only surface treatment needed in curing the concrete.

A strike-off board riding on the forms or finished slab smoothed the concrete to 5-in. thickness preparatory to placing the mesh reinforcement. Flat-tired wheels replaced the flanged wheels on the finishing machine for moving along the completed slab. By laying two strips in one operation, the machine was able with ease to finish perfectly the 800 ft. of slab which would be placed in a day's run.

Curb forms were set close behind the finishing machine. The sturdy forms, easily erected and stripped, made construction of the integral curbs a simple matter. Blaw-Knox forms were used for both slab and curb.

R. A. Young, assistant engineer, supervised operations for the Highway Department, acting under the direction of J. L. Herber, division engineer.

MATS under the paver enabled the machine to move over the slab before the concrete had attained its full strength

How California Contractors Handle

Heavy Wood Trusses

SOUTHERN California contractors have been giving a great deal of thought to economical methods of erecting heavy wood trusses 60 ft. or more in length and a few examples of what they have accomplished are afforded in the construction of several moving picture studio buildings in that locality.

On jobs of this kind it has been found imperative to lay out the trusses on the ground in such a position that they can be hoisted and anchored most effectively.

In erecting the 110-ft. trusses for the stages of the Mack Sennett Studio, recently constructed, the Austin Company of California followed this plan. The trusses were placed two deep on either side of a center aisle within the foundation. A crane not only placed the trusses, but also the columns and struts, this job having been taken into consideration when the path of the crane was made. Another saving was effected by having the crane hoist sheathing and joists as every second truss was anchored.

Fifty-two bowstring trusses of Oregon pine, 137 ft. long and each weighing approximately 7 tons, were constructed within the foundations of the stages for the First National Studios at Burbank, Calif., laid three deep in positions convenient for handling and erected at the rate of one an hour by a traveling crane with a 65-ft. boom. The weight of the trusses required that the boom be kept at practically maximum elevation at all times. When 12-ton trusses were designed for some stages built later the crane that erected the first trusses was found inadequate to handle them. The crane boom, therefore, was shortened to 40 ft. and it was used to drag the trusses to place where they were hoisted into position by a gin pole.

BOWSTRING TRUSSES, 137 ft. long and weighing 7 tons, were constructed within the foundations of the stages and placed three deep in correct position for hoisting.

CRANE, with 65-ft. boom, erecting 6-ton trusses for the stages of the huge Mack Sennett Studio. It also placed the columns.

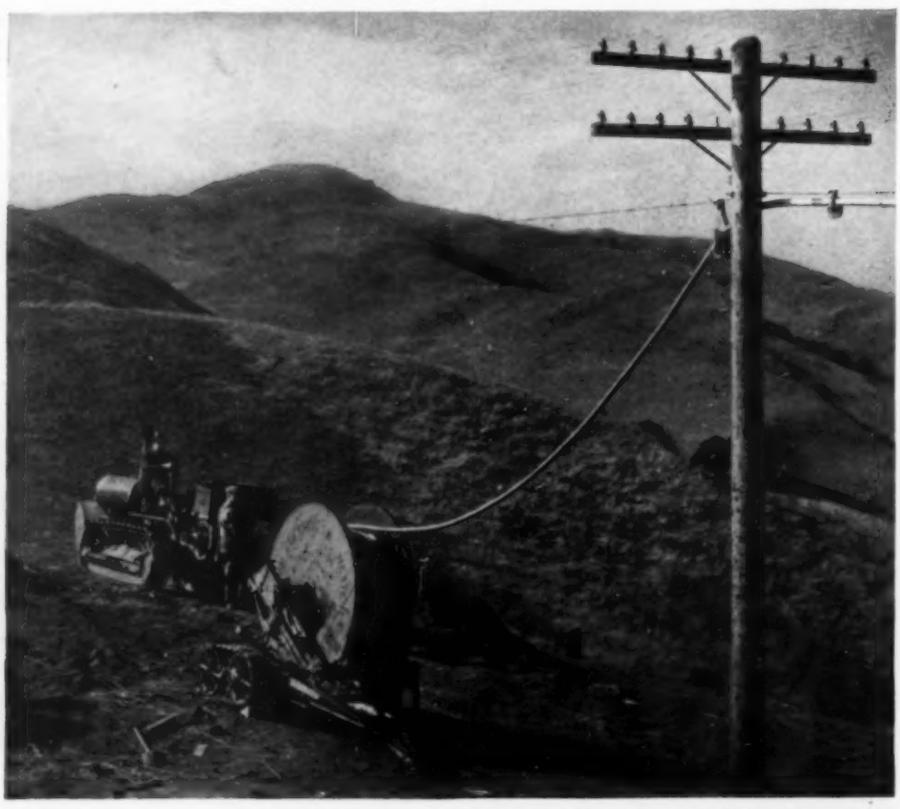
Getting Down to DETAILS

Close-up Shots of Job Methods and Equipment

LIKE LAYING CARPET *(right, in oval)*—Here's an application to theatre balcony and also to stairway tread and riser construction of Steeltex, the reinforcement with heavy waterproof backing which acts as a form to hold the concrete deposited upon it. This method was developed by Charles R. Geisler, of Pittsburgh, and is shown in use at the new Harris Theatre in that city.

GUIDE *(above)* of sheet pile strip welded to heavy plate bolted, in turn, to McKiernan-Terry hammer aids driving for Henry W. Horst Co. on big sewer job. Further details on page 6

CABLE STRINGING *(below)* on Pacific Coast is simplified by Caterpillar tractor with Willamette winch which pulls strands through overhead stringers from 2½-ton reels on Athey trailers.

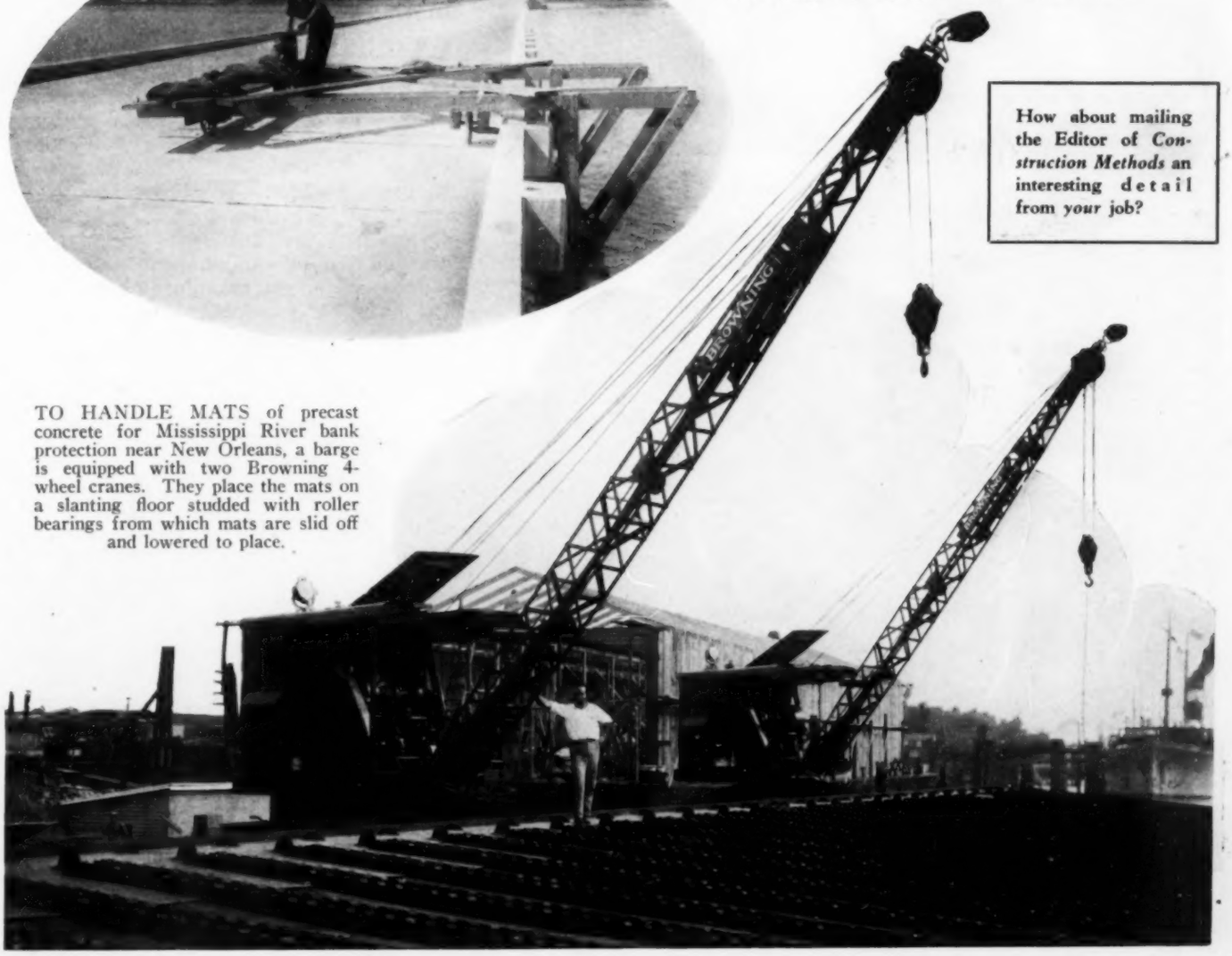


POST-HOLE DIGGER and pole setter mounted on and powered by a McCormick-Deering tractor simplifies field work by the Shippers Rapid Transit Co. for the Bell Telephone Co., Toledo, Ohio. Digger arm reaches across road ditch, leaving tractor on highway. This rig digs a 6-ft. hole in one minute, and with three men sets 115 poles a day.

MOVABLE SCAFFOLD helps electrician install wires for lighting standards on James River bridge, Newport News, Va., a Turner Construction Co. job. Horizontal wheel keeps rig at proper distance from curb.

How about mailing the Editor of *Construction Methods* an interesting detail from *your* job?

TO HANDLE MATS of precast concrete for Mississippi River bank protection near New Orleans, a barge is equipped with two Browning 4-wheel cranes. They place the mats on a slanting floor studded with roller bearings from which mats are slid off and lowered to place.



Arc-Welded Steel Framework

WELDED FRAMEWORK of Houston hangar in position and being welded. In the background are the trucks with the welding equipment

REAR AND SIDE VIEW of one of the hangars. Window frames have been placed and welded. Men in foreground are starting to cover the structure

WHEN the city of Houston, Texas, decided to build three large hangars at its airport for the convenience of its flying guests, the Houston Airport Corporation took into consideration various types of construction and eventually awarded the contract for the erection of fireproof hangars of arc-welded steel. The greater rigidity and strength of this type of construction coupled with its low cost were the deciding factors in awarding the contract. The lowest bid submitted for wood hangars was 25 per cent higher than the figure for arc-welded steel construction, and the lowest estimate based on riveted steel construction

SIDING OF CORRUGATED METAL in place. This all-metal type of structure is absolutely fireproof

for Houston Airport Hangars

was 40 per cent higher. Another feature of the arc-welded steel hangars was the simplicity of the design due to the elimination of all trusses and other forms of roof bracing which would interfere with the housing of "blimps" and similar lighter-than-air craft.

The hangars are 75 ft. wide, 125 ft. long and approximately 50 ft. high. The arches are made up of channel-shape sections cut to form the arch when butted end to end and welded together. The entire fabrication of the arches was completed on the ground, an arch being raised into position and held in place by the welding of the channel purlins to the arches. The framework of the hangar is shown in two of the photographs on the opposite page. The columns at the closed end also are channel sections. The framework of the monitors is composed of angles and channels. The steel sash in the sides and end wall were arc-welded in place. In fact, there are no bolts nor rivets in the framework of the three hangars.

All the fabricating work on the hangars was done in the field. Two portable Lincoln Stable-Arc welders driven by Buda 4-cylinder gas engines were used to supply the welding current. Approximately 1 gal. of gasoline per hour per machine was used.

After the framework had been erected, the window frames were placed in their respective positions and welded. Then Armco corrugated metal sheeting was used to cover the steel frame, making the hangars fireproof.

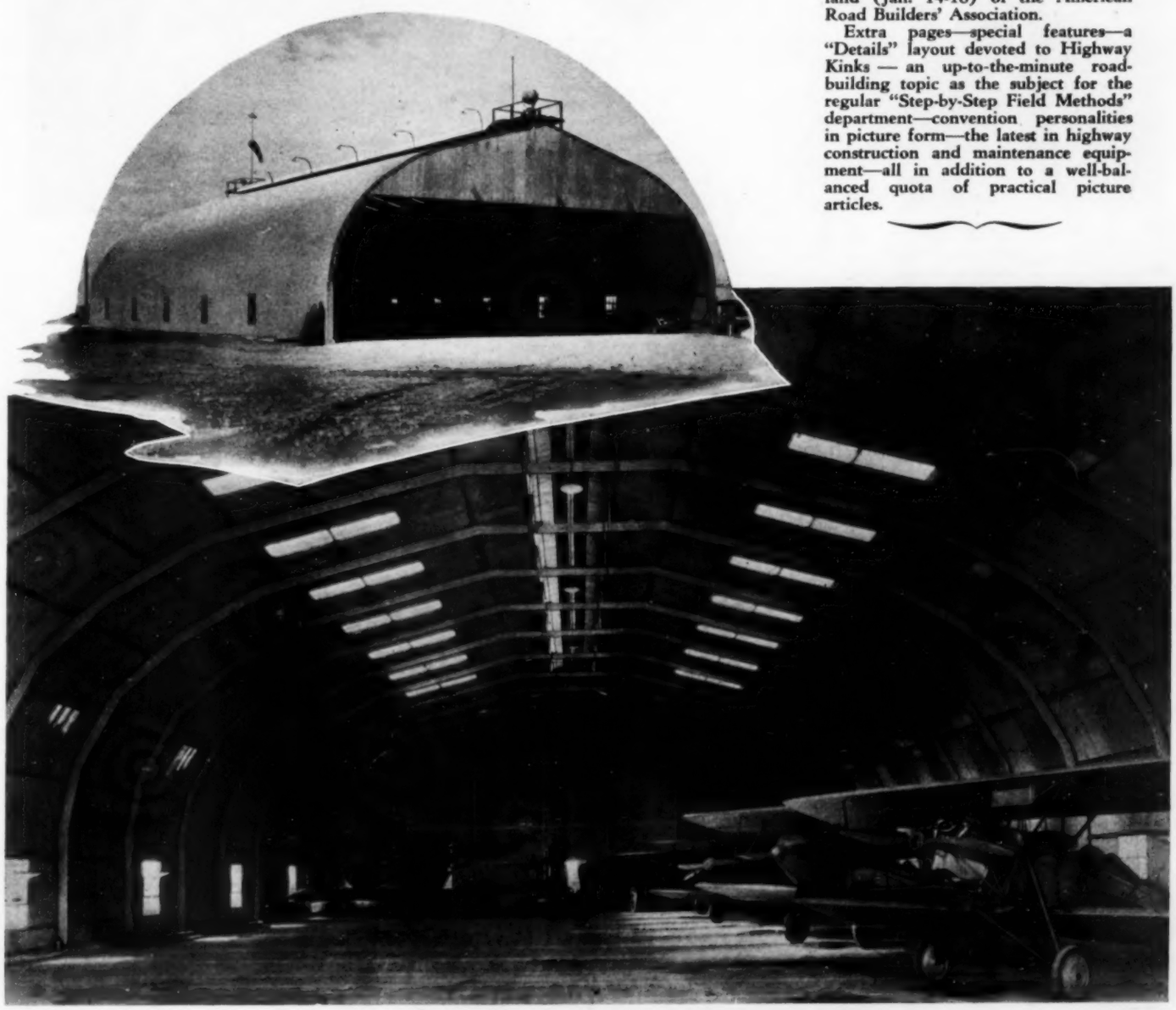
The average construction force on the job consisted of one foreman, 28 welders and two laborers.

The hangars were constructed by the C. J. Frankel Company, of Houston.

Road Builders' Number

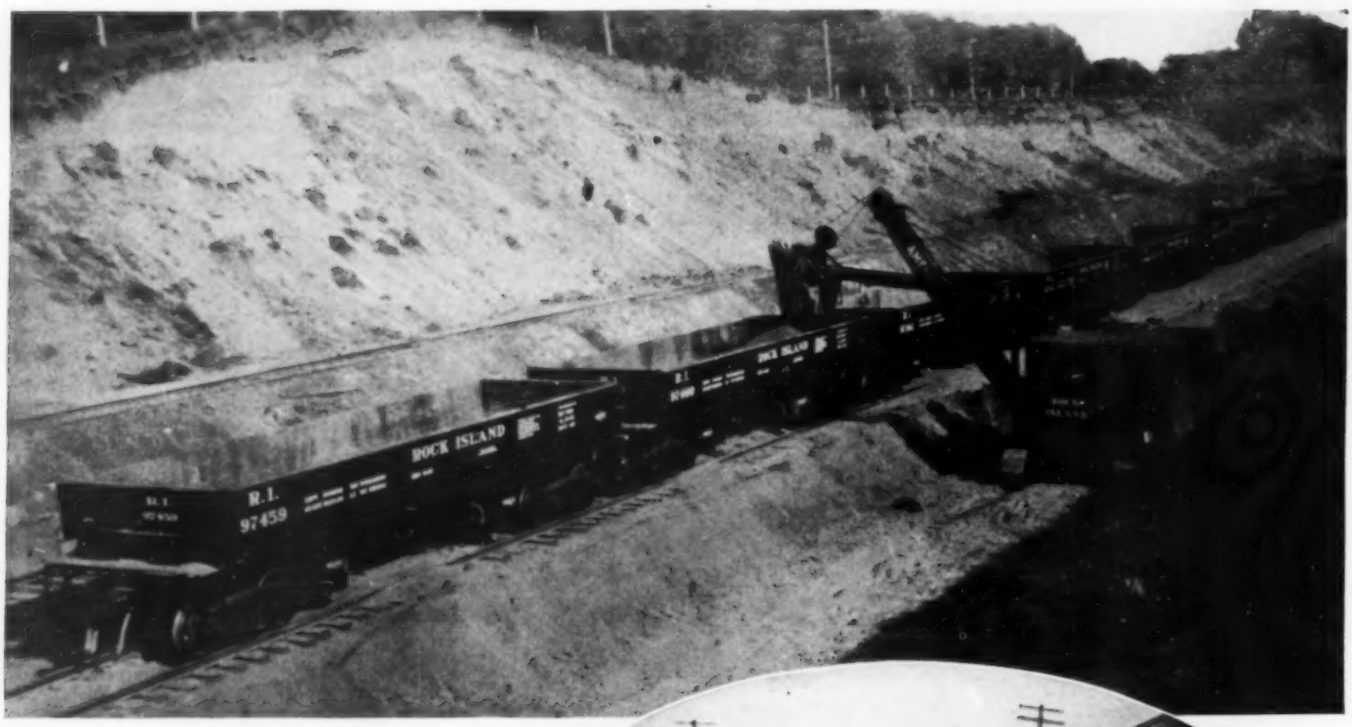
It's coming next month—the annual Road Builders' Number of *Construction Methods* appearing on the eve of the big convention and show at Cleveland (Jan. 14-18) of the American Road Builders' Association.

Extra pages—special features—a "Details" layout devoted to Highway Kinks — an up-to-the-minute road-building topic as the subject for the regular "Step-by-Step Field Methods" department—convention personalities in picture form—the latest in highway construction and maintenance equipment—all in addition to a well-balanced quota of practical picture articles.



FREEDOM FROM TRUSSES and roof bracing is one of the most advantageous features of this type of hangar. (*Insert*) ONE OF THE COMPLETED all-steel hangars ready to receive Houston's flying guests

DUMP CARS *for Track Work*



WAITING FOR A LOAD. Train of dump cars being filled by an American Gopher gasoline shovel in the cut near Wyanet, Ill.

DUMP CARS played an important part in the Rock Island Lines' plan of reducing grades for 21 miles between Bureau and Sheffield, Ill., where the maximum westbound grade was lowered from 0.6 to 0.3 of 1 per cent.

Most of the hauling was done by 20-yd. Western automatic air-dump cars, but later the Rock Island company added ten 30-yd. Western drop-door, air-dump cars. Where the finished grade of the two main line tracks was not on the same level these dump cars were able to spread the material from the lower track on to the track 18 in. higher without fouling the rails of the lower track.

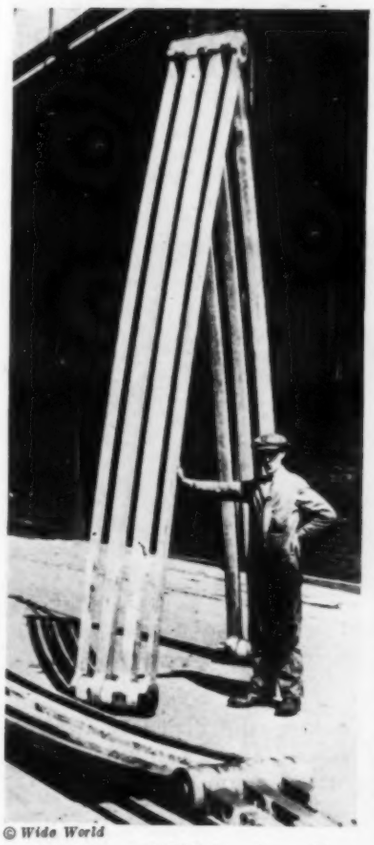
C. L. Ruppert is division superintendent and R. A. Brown engineer in charge of grade changing, under the direction of A. C. Bradley, division engineer of the Rock Island. J. B. Mabile, supervisor of work equipment, organized the job and selected the equipment.

SPREADING THE MATERIAL in position for track raising after it has been dumped on high track.

AT THE DUMP. Two rear cars have discharged their loads and stand with drop doors in position for clearing ballast.

JOB ODDITIES

A Monthly Page of Unusual Features of Construction



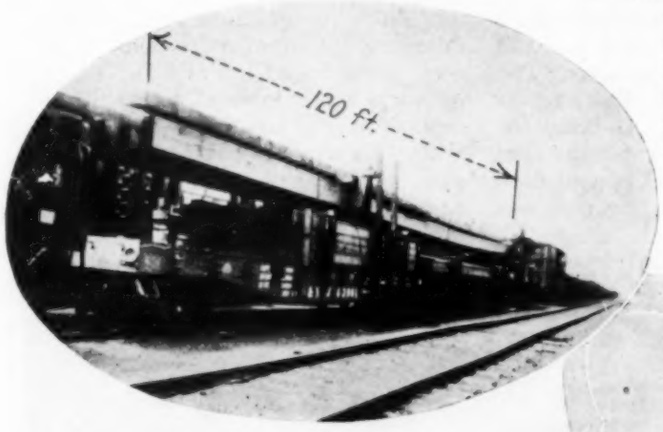
© *Wide World*

STEEL GIRDLE for St. Paul's Cathedral, London. To check spreading of dome of historic structure weakened by age and weather, masonry has been encircled with immense chain of rustproof steel links.

A CHRISTMAS TREE THAT'S FIREPROOF—Oscar Hellgren explains to his daughter how he made her Christmas tree by splicing various lengths and sizes of the American Cable Company's preformed wire rope

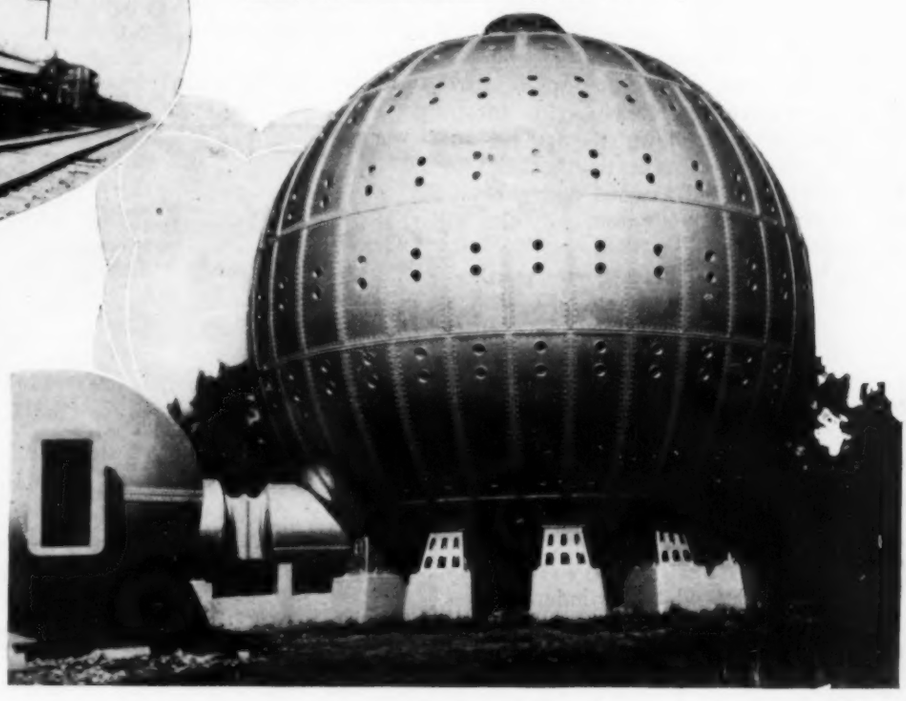
© *P. & A.*

FIRST STEEL for huge New Yorker Hotel descends into 75-ft. "hole" in solid rock to form grillage supports for columns. George J. Atwell Co. handled the big excavation job. The American Bridge Co. is erecting the steel



"BIG STICKS"—(*Left*) How Teddy Roosevelt, in the old days, would have revelled in wielding these 120-ft. long fir timbers, each weighing 2½ tons, the longest ever shipped by rail by the Marsh & Truman Lumber Co., Chicago. With the timbers chained at each end the center car served as a swivel in negotiating curves between Kelso, Wash. and Parkersburg, W. Va.

Photo from JOSEPH McGOVERN Elgin, Joliet & Eastern Ry.

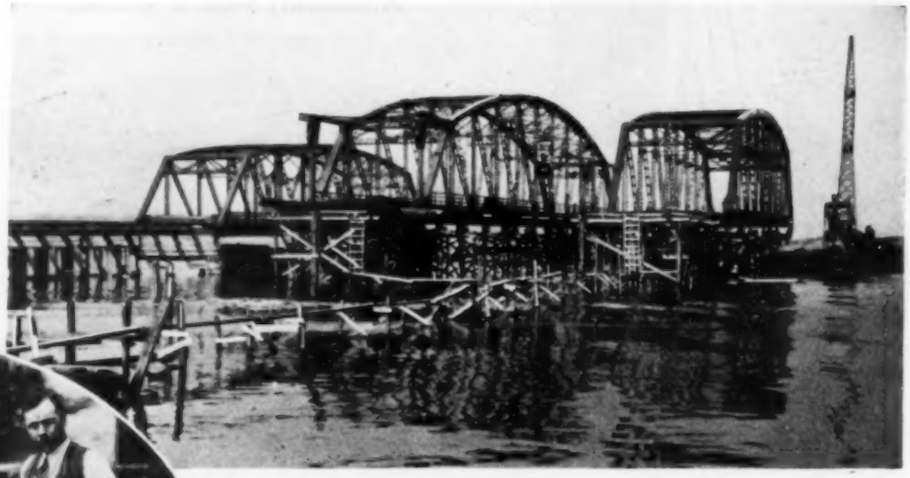


FOR COMPRESSED AIR CURE—(*Right*) Steel sphere, 64 ft. in diameter, has been built at Cunningham Sanitarium, Cleveland, by Biggs Boiler Works, to house patients receiving compressed air treatment for anaerobic germ diseases. The sphere is of 1½ in. steel plate with 100 port holes of thick plate glass and contains five floors of bedrooms, baths, dining room and lounge. Entrance to sphere is through air locks at left 16 ft. in diameter. H. H. Timken, the roller bearing manufacturer, financed the project. The general contractor was the Melbourne Construction Co.

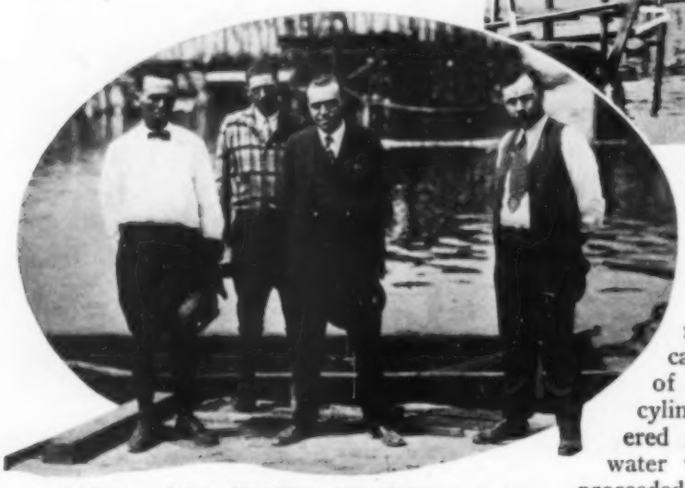
A Few Kinks on Bridge

ON THE substructure of the Norfolk-Portsmouth bridge in Virginia the contractors, the Hardaway Contracting Company of Columbus, Ga., and Carpenter & Petrie, Inc., of Norfolk, Va., developed special methods for building 25 five-pile trestle bents for the approach spans and six river piers.

Pile Trestle Bents—For the trestle bents the design called for wood piles



TRUSS SPANS were erected on two sets of falsework and were floated into position by the Atlantic Bridge Company



(Left to right) VANCE HUNTER, superintendent for the Atlantic Bridge Company; W. C. BREWER, engineer for the substructure contractors; C. C. CARPENTER, in charge for Carpenter & Petrie, Inc.; and R. E. HARDAWAY, JR., of Hardaway Contracting Company

65 to 85 ft. long with their upper portions encased in 32-in. cylindrical steel shells filled with concrete, reinforced. At the top of each cylinder was bolted a temporary lifting ring containing eight holes equally spaced for eight vertical ¾-in. deformed reinforcing bars. The drawing on the opposite page gives a vertical cross-section of the cylinder and shows the rubber gasket sealing device at the bottom. Eight bolts clamped a wood and rubber gasket to the bottom of the cylinder.

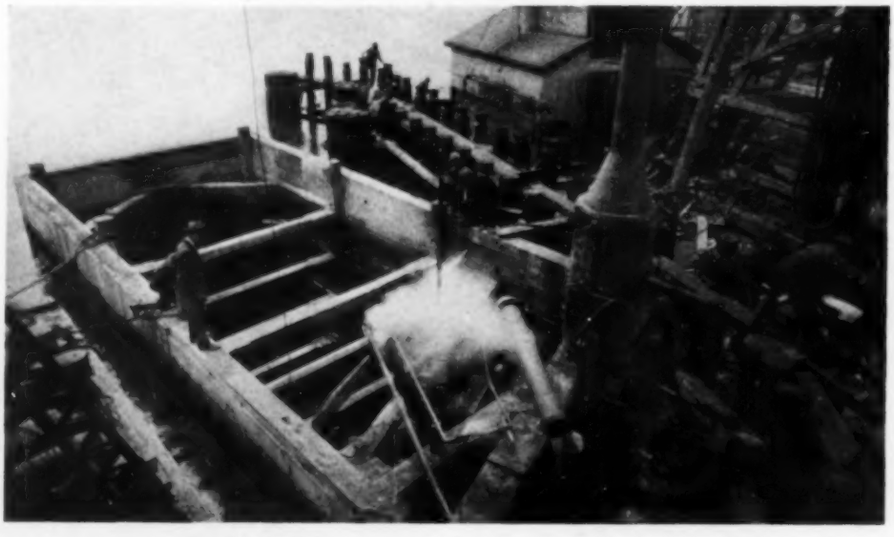
The rubber gasket was of pure gum, ½ in. thick, with its 10-in. round opening centered. This gasket was slipped over piles 14 to 17 in. in diameter. The wood ring was 5 in. wide, built up of two laminated 1-in. boards.

The reinforcing steel of eight vertical bars and a ¼-in. spiral was set in the cylinder, the threaded lower ends of the bars being drawn up tight with nuts against both sides of the gasket. The gasket was then started over the head of the pile and the cylinder was lowered until the gasket was within about 1 ft. of the water.

Concrete was poured into the cylinder to a depth of 3 ft., the rubber gasket seal carrying the weight of the mixture. The cylinder was then lowered gradually into the water while concreting proceeded. The sides of the cylinder were hammered to make the concrete settle against the pile and the concrete was spaded and rodded vigorously until a 7-ft. depth of concrete was in the cylinder. The cylinder then was lowered to its final position, a minimum of 3 ft. below the mud line. The upper reinforcing steel was placed, concrete was poured flush with the top and the lifting ring was removed.

Cylinder lengths varied from 8 to 20 ft. To keep the cylinders from dropping below grade in soft mud they were supported on top of the pile by cross rods.

River Piers—Four of the six river piers were of the large cylinder type on pile foundations. To construct these piers, falsework piling 65 ft. long was driven to give 6-in. clearance inside the wales. The permanent cylinders were fabricated by the Virginia Bridge & Iron Works and were placed in position on wire cables fastened to the falsework. Cofferdam sections, 9 ft. deep, were bolted on, and the whole cylinders were lowered to grade at depths varying from El. —27 to El. —40. Excavation was completed inside the cylinders, piles were driven, and seal concrete was placed by tremie to El. —10. The cylinder then was unwatered, piles were cut off at El.



CAISSON for one of the piers of the lift span

Pier Construction

—9, and base concrete was placed to El. —5. Forms for the shafts were built on the base, concrete was placed to about 1 ft. above high water, the cofferdam cylinder was removed, and forms for the coping were placed.

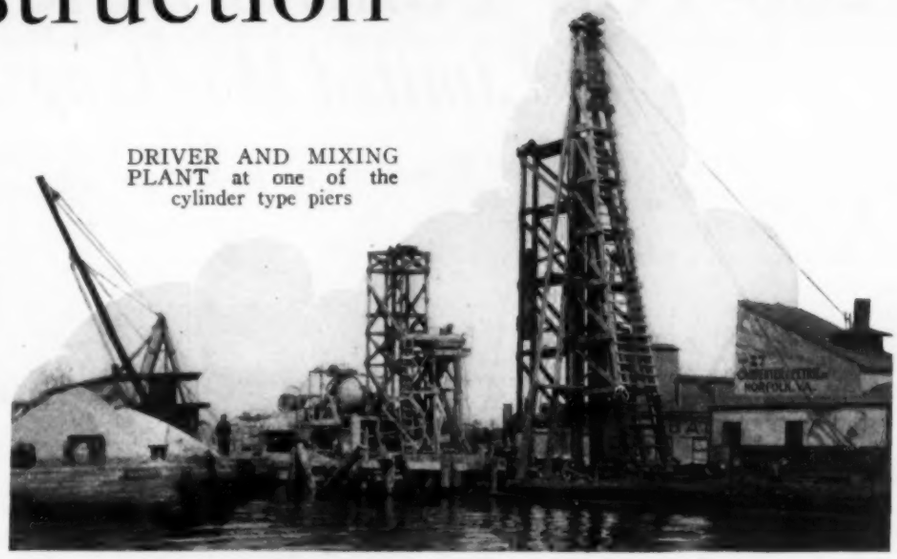
Lift Span Piers—The piers for the lift span of 283 ft. 6 in. were built by use of timber caissons, 20x44 ft. in plan. Falsework piling, both vertical and batter, was driven and was framed in with top and bottom wales. Rails of 80-lb. section 70 ft. long were driven inside the falsework to El. —60 to act as guides for the caissons. Construction of the caissons was started about at the water line on four 12x12's hung from the falsework. As building progressed the cables were slacked off until the caisson floated, when the four 12x12's were removed.

The caissons were built to a height of 46 ft. of laminated 12x12's, calked on the outside, sheeted with 2-in. plank and stiffened with two sets of transverse braces. After completion, 200 tons of steel rail was placed on top. This weight, in combination with inside excavating, was sufficient to sink the caissons to grade at El. —40.

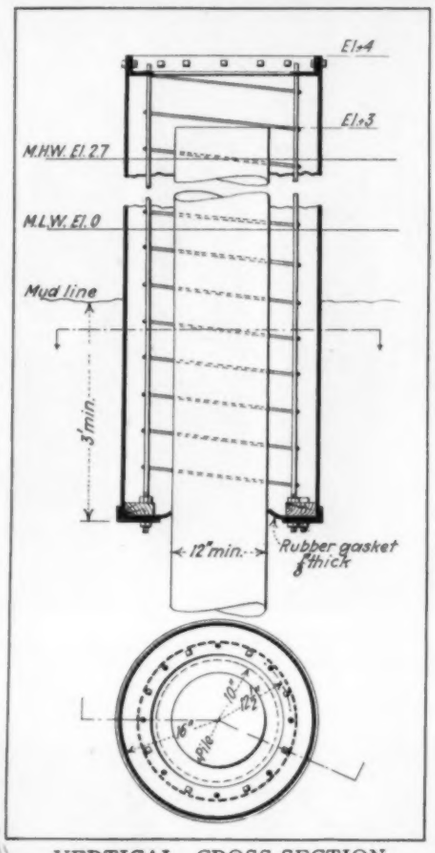
Pile Driver and Mixer Barges

Piles 75 ft. long were driven to a 40-ton bearing with the steam hammer, and a 20-ft. concrete seal was placed by tremie. The caisson was pumped dry, the piles were cut off, and base concrete was poured to El. —12. Forms for the shafts and coping then were built, and the remainder of the concrete was placed.

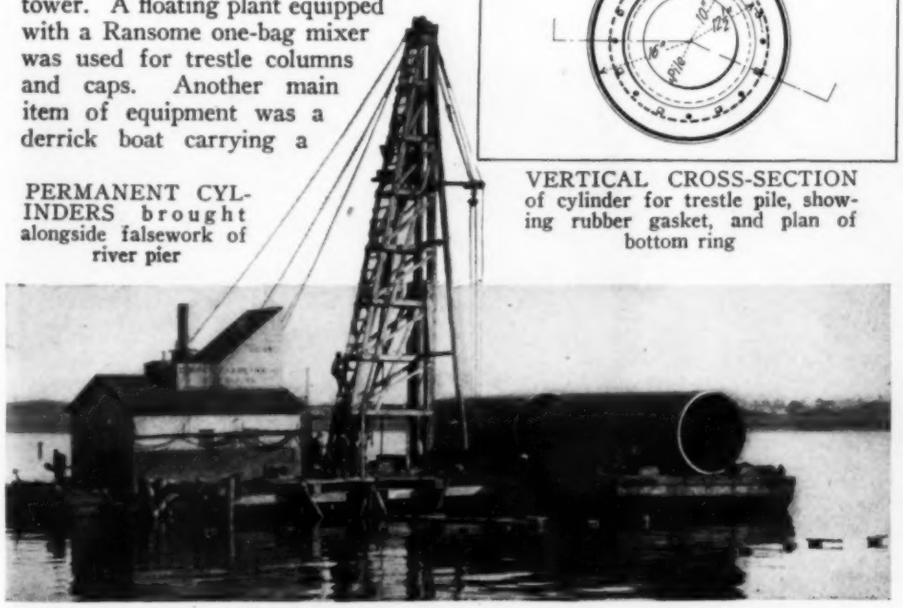
The mixer boat was equipped with a 1-yd. Smith mixer and a 35-ft. hoist tower. A floating plant equipped with a Ransome one-bag mixer was used for trestle columns and caps. Another main item of equipment was a derrick boat carrying a 5-ton, 45-ft. boom, American steel stiff-leg derrick.



DRIVER AND MIXING PLANT at one of the cylinder type piers



VERTICAL CROSS-SECTION of cylinder for trestle pile, showing rubber gasket, and plan of bottom ring



PERMANENT CYLINDERS brought alongside falsework of river pier

Daily requirements of cement were delivered on barges from the plant of the Virginia Portland Cement Company one-fourth mile from the job on the South Branch of the Elizabeth River, over which the bridge was built. Both the mixer boat and the two floating pile drivers carried Westinghouse compressors for use in boring and framing caisson timbers. The pile drivers were fitted with 60-ft. leads and Vulcan steam hammers.

The Atlantic Bridge Company, of Greensboro, N. C., was the contractor for the structural steel and the deck. This concern erected the four practically identical truss spans of a little less than 200 ft. on the same set of falsework. The lift span of 283 ft. 6 in. was erected on its own falsework. After erection of the lift span, all piles were removed except two clusters at each end. The deck slab was poured before the span was floated into place.

In floating the spans off the falsework and in placing them on the piers, advantage was taken of the tides. Barges were floated under the spans at low tide, and the rising tide lifted the trusses off the falsework. They then were put in position above the piers, and, with the ebb tide, were lowered on to the bridge seats.

The men in charge of the work for their respective organizations were R. E. Hardaway, Jr., Hardaway Contracting Company; C. C. Carpenter, Carpenter & Petrie, Inc.; and Vance Hunter, Atlantic Bridge Company. Harrington, Howard & Ash of Kansas City and New York, were the designing and supervising engineers of the project. Representing this firm on the job was E. E. Paul, resident engineer.

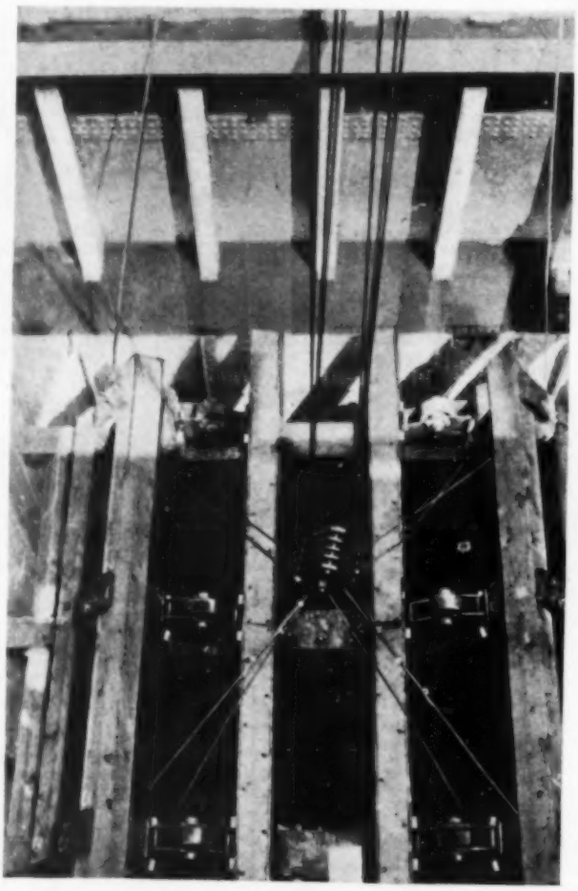
200-Ton Tunnel Shield Erected
in Limited Working Space

By R. L. Telford
Mason & Hanger Co., Inc., New York, N. Y.

AN UNUSUAL method of erecting the 200-ton shields used in driving compressed air subway tunnels under the East River from New York to Brooklyn was employed by Mason & Hanger Co., Inc., New York, who are the contractors for this work. The shields were shipped from the foundry in quarter sections, exclusive of the platforms and diaphragm walls and were assembled in the bottom of the shafts. The shields fitted so closely into the space at the bottom of the shafts that enough working space was not available for workmen to rivet and weld all four seams with the shields in one position.

Cradle with Rollers

To overcome this difficulty the contractor designed a cradle shown in one of the photographs on this page. This cradle was constructed of heavy timbers bolted on a solid base, each timber being laid on the same arc as that of the shield and capped with a ⅜-in. bearing plate. Six heavy rollers designed to carry the weight were mounted on the base between the timber slides so that the shield, on the first operation, would rest on the rollers and be supported several inches above the surface of the bearing plates on the timbers. The shield was then rolled by a crane with a seven-part line to any position desired for riveting and welding the seams of the four shield sections.



TIMBER CRADLE equipped with rollers being lowered to place at the bottom of the shaft.

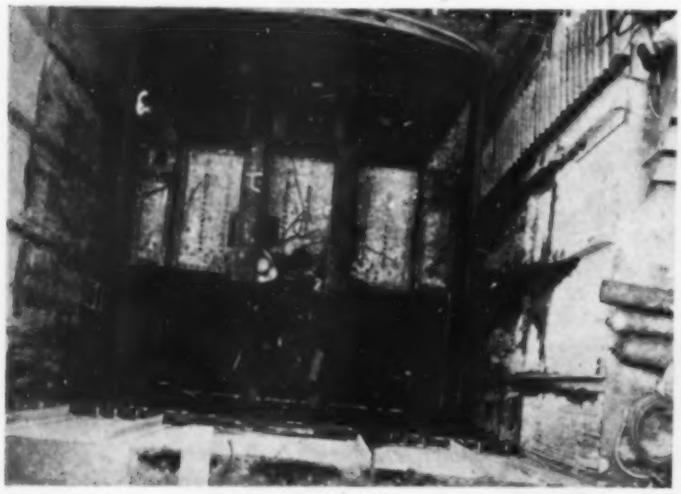
After this operation was completed, the shield was jacked up off the rollers with hydraulic jacks so that the bearing pins of the rollers could be taken out and the rollers allowed to drop down. The shield was then lowered on to the bearing plates, ready to be shoved out through the drum of the shaft.

Eight Shields Erected

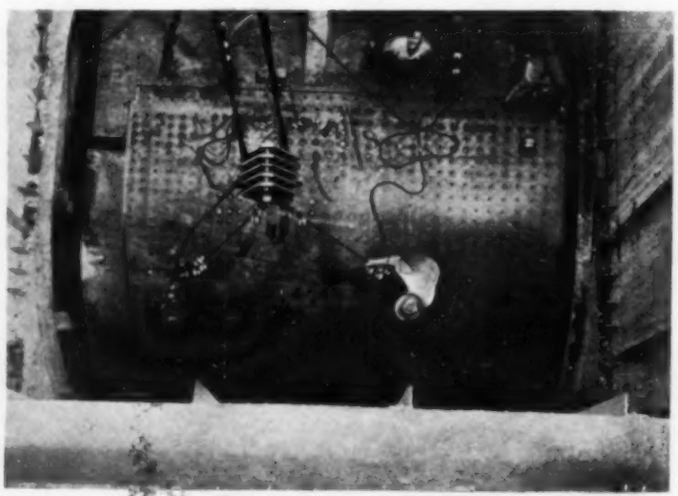
A total of eight shields, each weighing a little more than 200-tons, was erected in this manner and successfully completed in a short time.

Work on the two-tube shield tunnel, which is to be 9,104 ft. long, was begun in 1927, and four years' time will be allowed to complete the job. The bottom of the tubes will be at a depth of from 50 to 80 ft. below the ground surface and from 20 to 40 ft. below groundwater level on the shore ends. The soil is fine sand which makes necessary great care and skill in driving the tunnel.

The Board of Transportation of New York City is in charge of the work, which is being done under the direction of Robert Ridgway, chief engineer, Col. J. R. Slattery, deputy chief engineer of construction, and J. B. Snow, division engineer.



ONE-HALF of shield with platform and diaphragm walls bolted in place.



PLACING last quarter section of shield prior to riveting and rolling the whole as a unit.

Present and Accounted For —

A Page of Personalities

Photo, Courtesy N. Y. Sun

Gets Biggest Contract

PATRICK McGOVERN, New York contractor, has been awarded the largest single public works construction contract ever let in the United States—$42,692,568—for the New York Board of Water Supply's tunnel No. 2, 17 ft. in diameter, to distribute Catskill aqueduct water within the city limits. In size this contract is exceeded only by the Susquehanna Power Company's $52,000,000 Conowingo hydro-electric development in Maryland.

Former Doughboy Big Contractor

IRWIN S. CHANIN, since his discharge from the Army eight years ago, has taken rank among the leaders in New York building construction. In addition to the Roxy and other prominent theaters, he recently completed a huge 52-story office structure at 41st St. and Lexington Ave.

He Flies to His Jobs

C. F. LYTLE, contractor, with offices in Mexia, Texas and Sioux City, Ia., uses a Ryan airplane to make trips from one job to another. He specializes in highway and bridge construction.

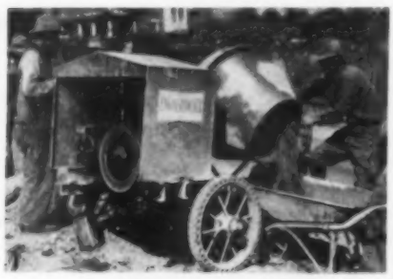
Promoted to Construction Engineer

A. L. HAMBRECHT, in recognition of seven years of efficient service as division engineer, has recently been promoted to become construction engineer of the Wisconsin Highway Commission. He joined the state highway department as surveyor in 1915.

NEW EQUIPMENT ON THE JOB

A New Tilting Mixer for Contractors' Use

The Knickerbocker Company of Jackson, Mich. has brought out a 3½-S trailer type tilting mixer for use on jobs where a light, speedy machine is needed. The drum may be easily and



quickly tilted and locked in any desired mixing position on either side. It is of proper height, both for loading and discharging. It is powered by a 2-hp. Stover engine with Wico magneto.

Force Attachment for Pumps

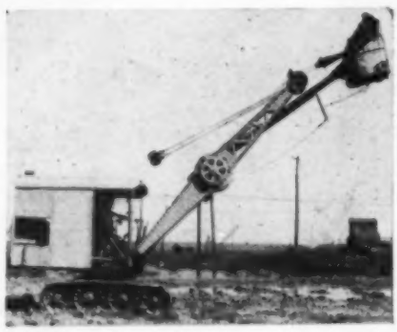
When dewatering trenches or other depressions, there often arises the necessity of discharging the water handled by the pump either above the

location of the pump or horizontally through a line of pipe or hose. This situation has been taken care of by the Domestic Engine & Pump Co., of Shippensburg, Pa., by the recent manufacture of a force attachment which may be applied either to its single diaphragm pumps or to its double units.

This attachment consists of two parts: a clamp device that is used to lock shut the valve in the diaphragm and a "goose-neck appearing" device that is equipped with a Domestic double-wing-guide, air-vented, discharge valve. The valve has a threaded opening for attaching the discharge hose or pipe and is also tapped for connecting an air chamber and relief valve.

A Two-in-One Model

A new ½-yd. convertible crawler crane and shovel, called the Universal 35, is announced by the Universal Crane Company and the Thew Shovel Company, both of Lorain, Ohio, which have combined in this machine their



respective units of the Universal superstructure and the Thew center-drive crawler. The new machine has a complete range of interchangeable attachments, including clamshell and dragline booms, shipper shaft and ditcher type shovels, backdigger and skimmer scoop.

As a crane the new machine lifts 7 tons at 10-ft. radius, handling a ½-yd. clamshell or dragline bucket or a 1-yd. backfiller board.

The center drive principle also is incorporated in the ½-yd. shipper shaft shovel offered on this unit. The shipper shaft is placed in the center section of the shovel boom, thus giving the greatest operating ranges and clearances possible with the 14 ft. dipper stick and the 18-ft. boom.

Koehring Announces Big Equipment Combination

Philip A. Koehring, of Milwaukee, has announced an important consolidation of manufacturers of construction equipment under the name of the National Equipment Corporation, which he heads as president and treasurer. Included in the new combination are the Koehring Company, which manufactures concrete mixers, cranes, power shovels and draglines; T. L. Smith Company (concrete mixers); Parsons Company (trench excavators); and Insley Manufacturing Company (towers and chutes for concrete pouring and a ½-yd. power shovel). The four individual companies will continue under present managements as divisions of the new corporation.

Officers of the new corporation are: Philip A. Koehring, president and treasurer; W. J. Koehring, W. H. Insley, Harold E. Smith and H. C. McCardell, vice-presidents; W. J. Zimmers, secretary.

Three-Way Dump Body

An improved 3-way dump body and hoist manufactured in 1½ to 15 ton capacities for installation on any motor truck or trailer is a recent product of

the Commercial Shearing & Stamping Co., of Youngstown, Ohio. The hoist is of vertical underbody telescopic plunger and cylinder type. The body operates in three positions from the driver's seat. A safety device locks it in all positions.

McGRAW-HILL PUBLISHING COMPANY, INC., Tenth Ave. at 36th St., New York, N. Y.

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SUBSCRIPTION PRICES: United States and its Possessions, Canada, Mexico and other countries taking domestic postage rates, $1 for two years. All other foreign countries, $2 for two years. Single Copy, 5 cents. Published monthly. Entered as second class matter. Subscribers are requested to send both the old address and the new address when they move to a new address.

October, 1926, at the Post Office, New York, N. Y., under the act of March 3, 1879. Printed in U. S. A.

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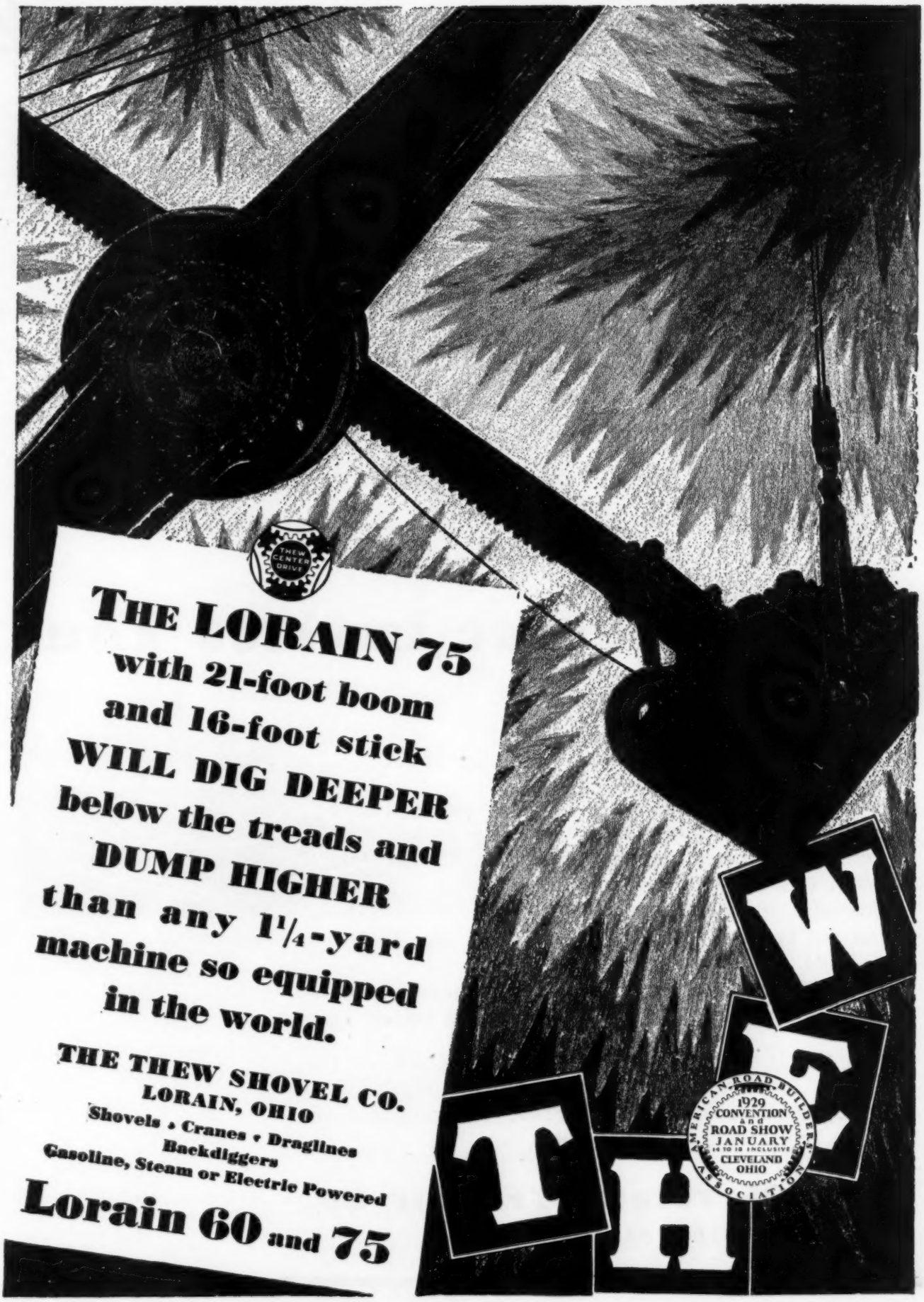

THEW CENTER DRIVE
THE LORAIN 75
with 21-foot boom
and 16-foot stick
WILL DIG DEEPER
below the treads and
DUMP HIGHER
than any 1¼-yard
machine so equipped
in the world.
THE THEW SHOVEL CO.
LORAIN, OHIO
Shovels • Cranes • Draglines
Backdiggers
Gasoline, Steam or Electric Powered
Lorain 60 and 75
THEW
AMERICAN ROAD BUILDERS' ASSOCIATION
1929
CONVENTION
AND
ROAD SHOW
JANUARY
14 TO 18 INCLUSIVE
CLEVELAND
OHIO

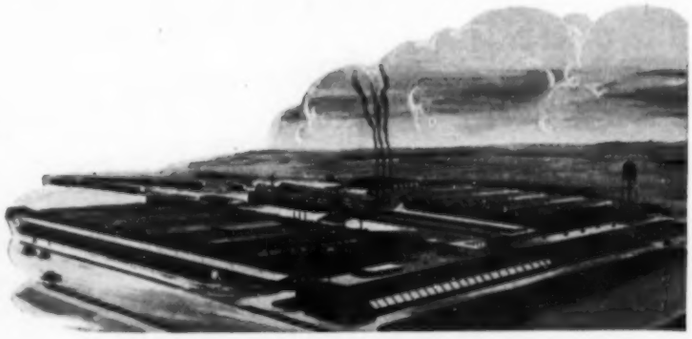
Again Cleveland Welcomes You —

Public Hall — Place of the Convention and Road Show January 14th to 18th, Cleveland, Ohio

AGAIN this year the city of Cleveland will be the gathering-ground for the great road-building fraternity at its TWENTY-SIXTH ANNUAL CONVENTION and GOOD ROADS SHOW! For five big days it will be the mecca of the highway industry. For five big days it will deal out pleasure and profit to all who come.

Everything is in readiness — for a successful convention, a great exhibition and a whale of a good time. Plan to be there — January 14th to 18th — and see the greatest array of road-building, maintenance and contractor's equipment ever assembled at one point.

Again Cletrac Invites You!

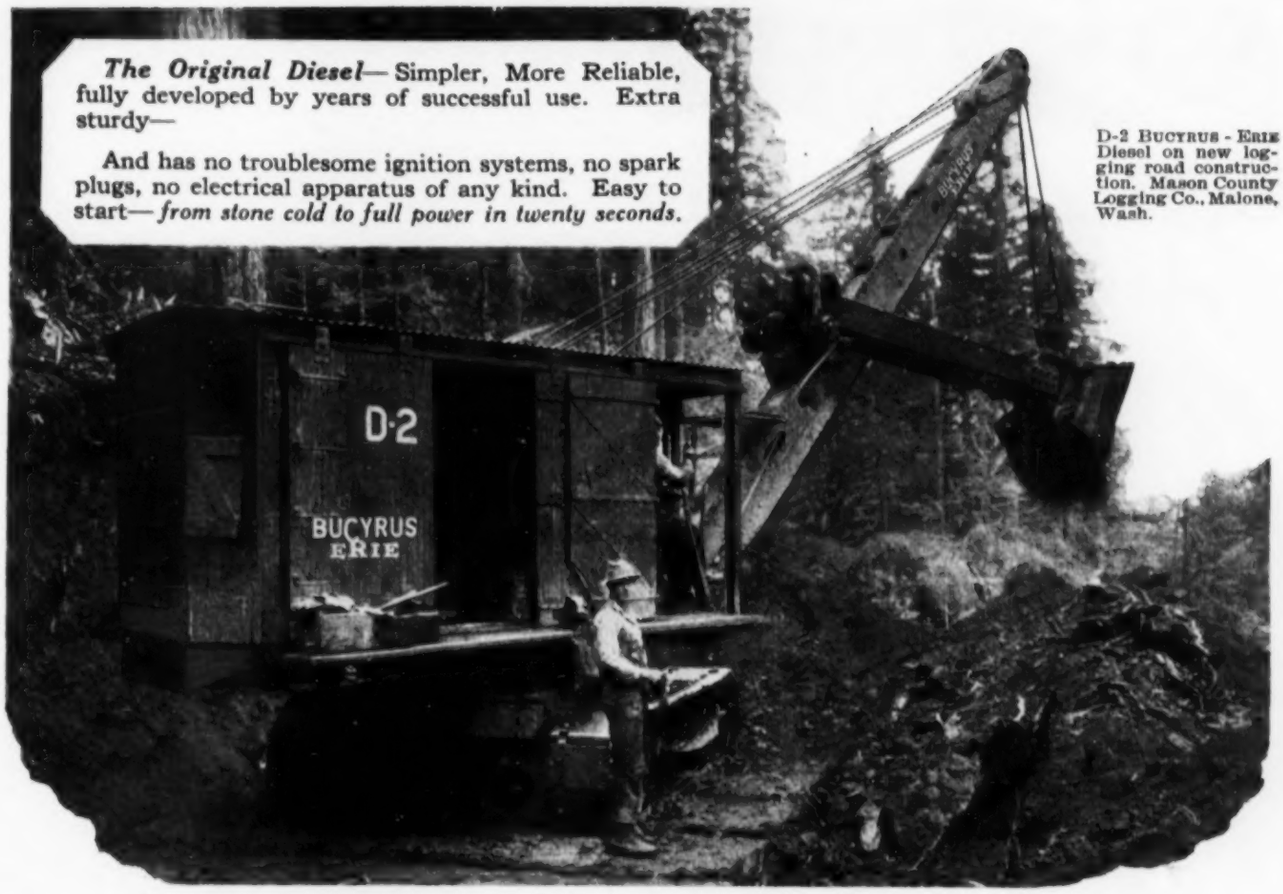


The Cletrac Factories and Office 19300 Euclid Ave., Cleveland, Ohio

CLEVELAND is the *home* of CLETRAC CRAWLER TRACTORS and again this year the Cletrac factory extends you a special invitation to visit its large plant while at the convention. Special entertainment is on the program and special demonstrations of Cletracs with various types of equipment will be held. Our factory exhibit is one in which many other manufacturers of contractor and road building machinery are taking part.

See the big show and the Cletrac exhibit at the Public Auditorium by all means — but don't fail to visit the Cletrac Factory, where big preparations have been made for your visit.

The Cleveland Tractor Co.
Cleveland, Ohio



The Original Diesel— Simpler, More Reliable, fully developed by years of successful use. Extra sturdy—

And has no troublesome ignition systems, no spark plugs, no electrical apparatus of any kind. Easy to start— *from stone cold to full power in twenty seconds.*

D-2 BUCYRUS - ERIE Diesel on new logging road construction. Mason County Logging Co., Malone, Wash.

47 cents' worth of fuel digs 1150 yds. of sandstone—

Daily record of their BUCYRUS-ERIE Diesel

"We moved 23,000 yds. of very hard sand rock in 20 days of 8 hours, straight casting—and the BUCYRUS-ERIE Diesel used only 10 gallons of fuel costing us 4.7c per gallon, or 47c per day. And—

POWER saves POWDER: "In the first 60 days we operated this BUCYRUS-ERIE Diesel I believe we *saved* $1,500 *in powder alone*, as compared with the gas shovel previously used."

The writer of the above report—O. S. Reed—has had a wide experience in the use of power shovels out in the woods—miles away from any repair shop. *Power* to dig rock, *Fuel Economy*, and *Reliability* are fully appreciated by Mr. Reed, who is Log Superintendent of the Northwestern Lumber Co., Hoquiam, Wash. He sums up the BUCYRUS-ERIE Diesel as—

"The best all-around shovel built for our work"

This shovel is the "best built" for any concern that wants *low costs* in all kinds of digging. Write for more reports from users—showing the results that you can expect.

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Plants: South Milwaukee, Wis., Erie, Pa., Evansville, Ind.
General Sales Offices: South Milwaukee, Wis., and Erie, Pa.

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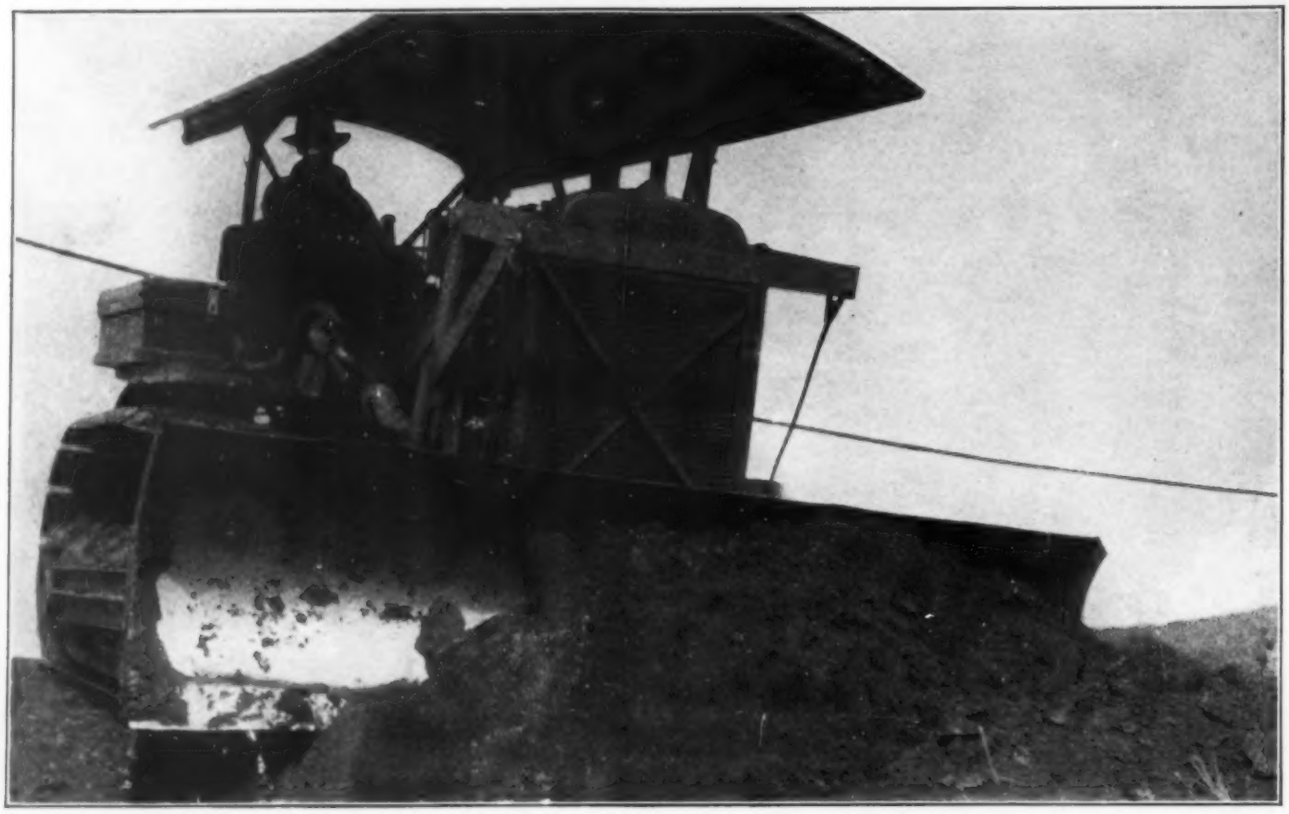
Spreading Profits



The tractor-drawn wagons have just dumped their full loads—now the bulldozer blade levels and fills—spilling the earth over the edge of the dump as fast as the wagons bring it up from the shovel. It's a "Caterpillar" job . . . "Caterpillar" track-type tractors hauling big crawler wagons . . . and "Caterpillar" tracks making it safe to bulldoze right up to the very edge!

Better, quicker, cheaper

SIXTY - $4600
THIRTY - $2650
TWENTY $2175
F.O.B. SAN LEANDRO OR PEORIA

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$1675
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CATERPILLAR
REG. U.S. PAT. OFF.
TRACTOR

Announcing

the NORTHWEST VARIABLE SPEED MOTOR accelerator controlled

Here is the most important power development since the adoption of gas engines for shovels, cranes and draglines. A flexible power plant, accelerator controlled instead of the old time fixed speed engine.

Variable speed, variable power, for every operating condition. For the first time motor car flexibility coupled with heavy duty performance in a new engine and control system of exclusive Northwest design [patents pending].

Astounding new standards of performance are made possible by means of this new power plant. Think how production can be speeded up with an engine which at a touch of the control will accelerate from its normal operating speed to a speed assuring from 15% to 20% greater yardage than would be possible with a constant speed engine.

watch for further details

NORTHWEST ENGINEERING CO.

1723 Steger Bldg. 28 E. Jackson Blvd. Chicago, Ill. CM 12-Gra3

NORTHWEST

CRANES · SHOVELS CONVERTIBLE and DRAGLINES

Contractors Prefer Electric Equipment

These reasons were given by representative contractors, queried in a nation-wide survey:

- Economy
- Few repairs
- Low upkeep
- High salvage value
- Dependability
- Best for cold-weather work
- Breakdowns minimized
- No smoke or soot
- No handling of fuel or ashes
- Reduced fire hazard
- Convenience
- Ease of handling and operating
- Compactness
- Flexibility
- Noiseless
- No water lines.

In the operation of CRANES

This caterpillar-type crane—a Northwest product—was used by James Stewart & Company to hoist broken concrete from the subway on Park Avenue, New York. G-E motors and control operated it.

James Stewart & Company is one of the many nationally known contractors who not only employ electricity on their projects but utilize it most effectively through G-E Motorized Power.

—and other contractors say:

"We find electric power is more convenient in every way. It is necessary on most work to have electric power installed for lights, drills, hammers, etc., therefore, it is of small cost to operate other electric equipment." *The Wm. Simpson Construction Co.*

Motorized Power
—fitted to every need

200-198

GENERAL ELECTRIC

GENERAL ELECTRIC COMPANY, SCHENECTADY, N. Y., SALES OFFICES IN PRINCIPAL CITIES

The ALLIS·CHALMERS· MONARCH . . .

Seventy-five
$5350.00
Fifty
$3625.00
F. O. B.
Springfield, Ill.

A new Economy for Cities and Communities

BULLDOZING rock on a fill-in job for a new park in New York City—a job that would ordinarily employ a whole gang of laborers . . . . Finishing tasks in a few hours that would usually take days to accomplish . . . . And saving money by saving time and labor.

—The Allis-Chalmers-Monarch never fails to exceed expectations on the biggest and toughest jobs. For this reason it is steadily gaining favor as a new economy for cities, towns and individual owners in the construction of parks, playgrounds or roads —for subdivision development, industrial, logging work or power farming.

Wherever sure-footed traction is a necessity . . . . wherever its unique combination of low weight and great draw bar pull especially adapts it to the earth movers requirements—the Allis-Chalmers-Monarch, designed and built by specialists in power machinery for eighty-two years, will demonstrate its spectacular ability to make small work of the biggest jobs.

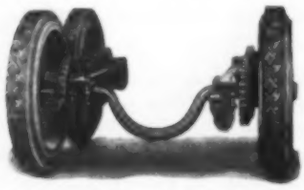
MONARCH TRACTORS CORPORATION
Subsidiary of Allis-Chalmers Mfg. Co.
SPRINGFIELD, ILLINOIS

Monarch Tractors

The noticeable flexibility of the Austin Dual Drive Motor Grader results from the free movement up and down of the tractor inside the grader frame—using the rear axle of the tractor as a pivotal point.

Heavy steel rocker beam connecting front and rear axles of tractor, with multiple leaf spring and Timken front wheel bearings.

Another Dual Drive detail—cut tooth sprockets and roller bearing drive chain connecting forward and rear drive wheels.



Special 3-in. high carbon steel axle under front end of tractor.

Dual Drive Features

More power

More traction

Freedom from skidding or miring.

Operates efficiently and economically on soft, wet or rough ground.

Practically all crawler tread advantages without high power consumption—friction or slow motion.

The Austin Dual Drive (10-20 model) is regularly fitted with 6-in. tires on all four drive wheels. For the heaviest service, however, 10-in. tires, such as those shown above, are recommended.

Description of the Austin Dual Drive

In the Austin Dual Drive Motor Grader, the tractor is an entirely separate unit from the rest of the machine. The tractor is mounted on four wheels instead of two, and all of these are drive wheels. A heavy steel axle has been provided directly ahead of the rear axle of the tractor and which is connected at each end by means of a heavy steel rocker beam to the rear axle housing, thus keeping the front and rear wheel always exactly in line. This axle is further attached to the front end of the tractor by heavy multiple leaf springs, so that the tractor has a spring support in its own mounting and in addition is free to move up and down inside the frame of the grader as the inequalities in the road surface make such movement necessary, using the rear axle of the tractor itself as a pivotal point.

The differential action in the rear axle of the tractor is passed on to the front wheels by means of the drive chains. The four wheels are positive drive wheels, each taking its portion of the traction load. This gives positive tractive effort on four separate and distinct points on the road surface.

The freedom of motion that the tractor has in the grader frame enables it to adapt itself easily to whatever type of road it may be passing over and the drive wheels on either side can pass over obstructions without deflecting the course of the grader as a whole.

A new development affecting every user of motor graders

The Austin Dual Drive Motor Grader

With this, the most revolutionary improvement ever made in motor graders, the old working limits have been broken down and new standards have been set for motor grader performance.

The new Austin Dual Drive can really "go the limit"—using, for the first time, every bit of reserve power that 10-20 or 15-30 McCormick-Deering power plants can deliver. Utilization of this extra margin of power is made possible by the four drive wheels that carry the tractor as a separate unit from the rest of the machine. Even with the blade taking a deeper bite than has heretofore been practical—these powerful machines bend to their task and keep moving ahead!

The increased traction from the four drive wheels enables a Dual Drive Motor Grader to go right through soft holes with little chance of spinning or miring. Even though the total weight of the Dual Drive is greater, there is less down pressure per wheel with four wheels. Yet you get added traction. With two drive wheels in tandem on each side the possibility of sliding sideways or skidding into a ditch is cut to a bare minimum.

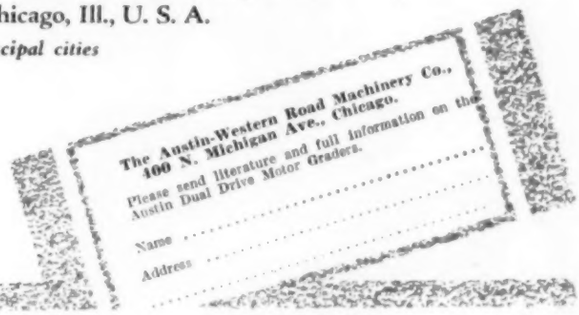
The steering is as simple as that of a motor car. With the front wheels kept straight ahead, the side thrust will not alter the course of the machine. When the wheels are turned, however, the whole machine responds instantly.

By their ability to keep going and to handle more work, fewer trips are needed to finish a job with these machines and a direct saving in time and operating costs is possible. These new developments affect everyone who uses motor graders or who ever will use one. Mail this coupon for complete information on *all* of the Austin Dual Drive Features.

The Austin-Western Road Machinery Co.

400 N. Michigan Ave., Chicago, Ill., U. S. A.

Branches in principal cities

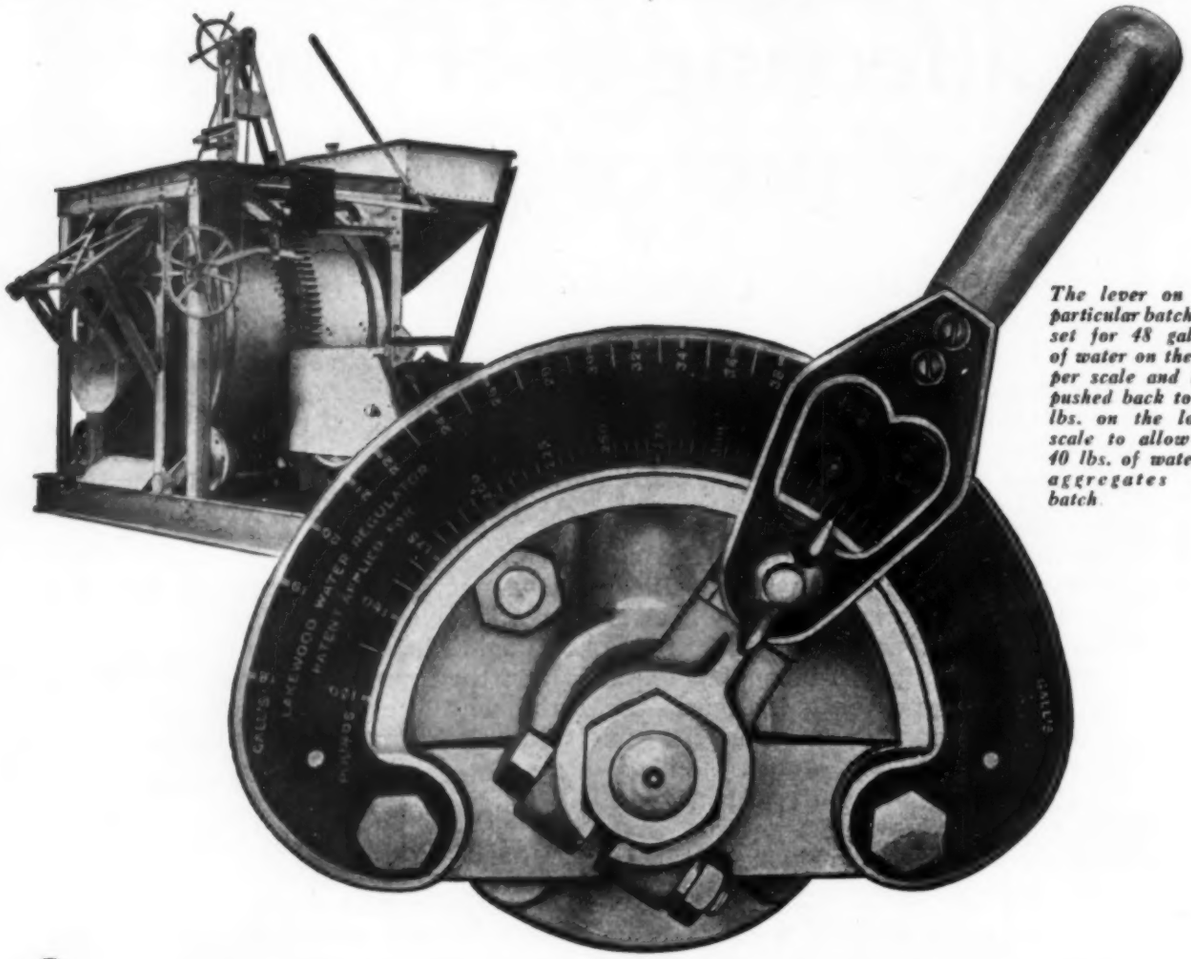

The Austin-Western Road Machinery Co.,
400 N. Michigan Ave., Chicago.
Please send literature and full information on the
Austin Dual Drive Motor Graders.
Name
Address

Austin-Western

ROAD MACHINERY

"Most miles for your road dollars"

LAKEWOOD CONCRETE MIXERS



The lever on this particular batch was set for 48 gallons of water on the upper scale and then pushed back to 360 lbs. on the lower scale to allow for 40 lbs. of water in aggregates per batch

Lakewood Water Regulators are built for mixers in all sizes from 7-S to 56-S inclusive.

Accuracy—

of water control for concrete. The simple, automatic mechanism of the Lakewood Water Regulator gives absolute accuracy batch after batch at any setting. Simultaneous readings in pounds and gallons on a graduated quadrant makes compensation for moisture in aggregate quick and easy.

Send for Bulletin 20-S for
"Some Day You'll Buy a Lakewood"

EXPORT OFFICES: 30 Church St., New York City - - CABLE ADDRESS: Brosites

LAKEWOOD
The Lakewood Engineering Co., CLEVELAND · O.

Announcing

—The Leach Mast Plant

ALL-STEEL

Compare the heavy all-steel construction of the Leach with others. Made in standard 20-foot sections for easy handling—it is strong and durable.

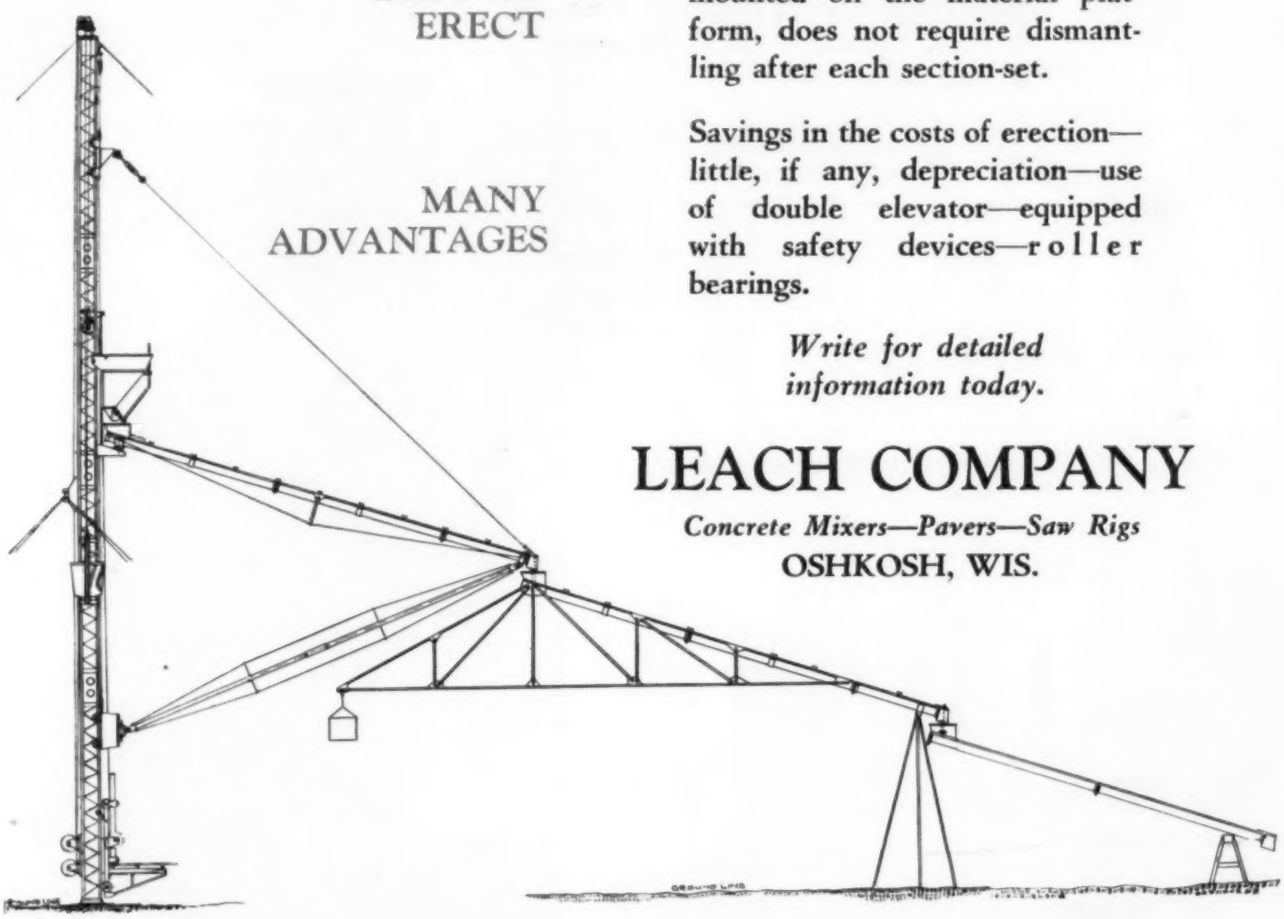
EASY TO ERECT

You can save time in its erection. The gin pole being mounted on the material platform, does not require dismantling after each section-set.

MANY ADVANTAGES

Savings in the costs of erection—little, if any, depreciation—use of double elevator—equipped with safety devices—roller bearings.

Write for detailed information today.



LEACH COMPANY

Concrete Mixers—Pavers—Saw Rigs

OSHKOSH, WIS.

LEACH MAST PLANT

Hercules Engines

In 2½ feet of mud Lombard Keeps Going

The Lombard Model T Tractor Truck is used in soft earth behind excavating equipment. It is used successfully also for plowing snow; for hauling lumber; for pulling scarifiers; for work in quarries and on sugar plantations. Under the most unfavorable conditions this tractor keeps going. One reason is because of its power. A Six-cylinder, Model YXC-2 Hercules Engine is used.

For any heavy-duty power need there is no power more reliable than that supplied by Hercules Engines.

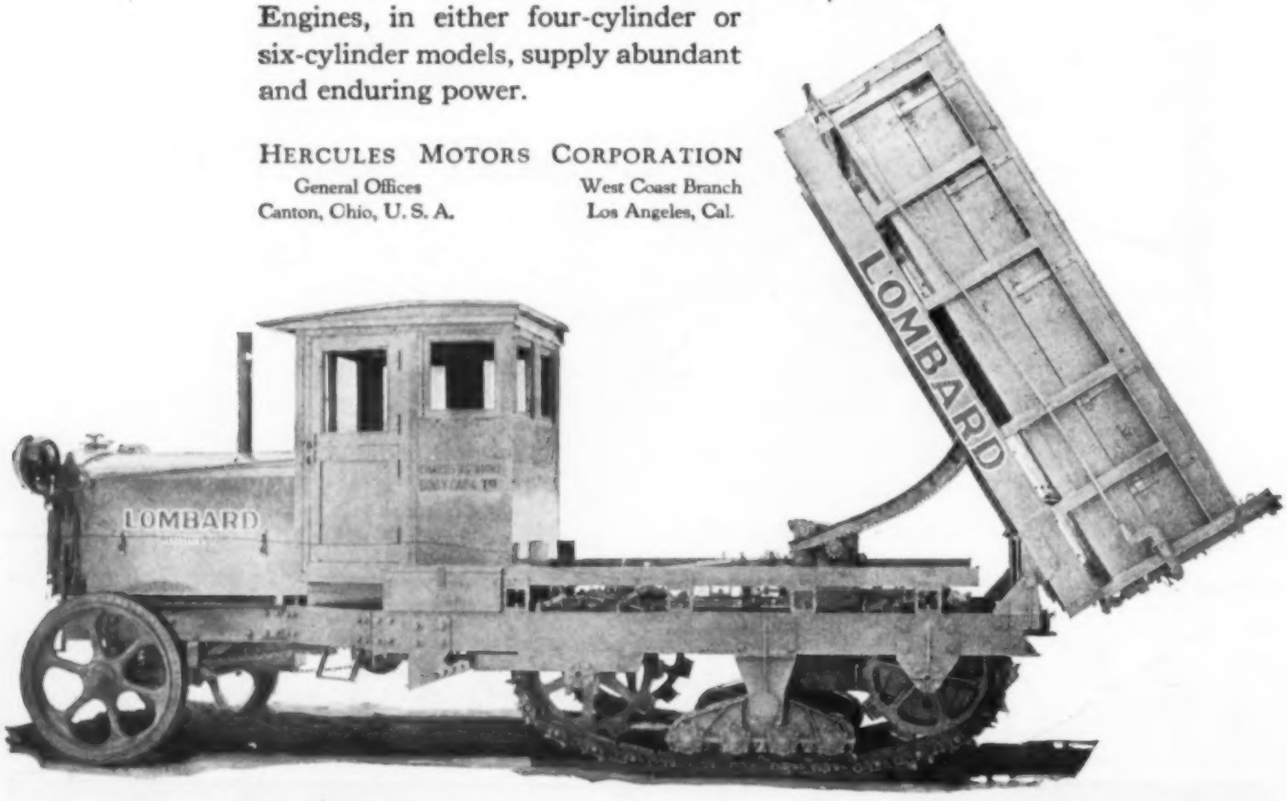
Builders of vehicles requiring heavy-duty power will find that Hercules Engines, in either four-cylinder or six-cylinder models, supply abundant and enduring power.

1929
CONVENTION &
ROAD SHOW
A.R.B.A.
JAN. 14 - 18
CLEVELAND, O

HERCULES MOTORS CORPORATION

General Offices
Canton, Ohio, U. S. A.

West Coast Branch
Los Angeles, Cal.



This "Ad" Aroused So Much Interest Last Month That We Are Repeating It

DID YOU READ IT ?

U. R. A. Contractor,
Somewhere, Everywhere.

Dear Friend:

Nowadays, you can't be chasing around hunting a gold mine to make your living. You're too busy. Besides gold can be easily made in other ways.

Using a Lowell Reversible Ratchet Wrench is one of the other ways. IT SAVES TIME AND TIME IS MONEY.

The man using this tool will tell you,—"No slipping,—no taking off and on the nut,—just one pull after another." That's the story every time.

When they built the Hudson River Vehicular Tunnel, the Lowell Wrench with its Reversible nature (and that's a good nature to have, too) was right on the job. It performed so well that they have now asked it to help on the new tunnel. It's already at work.

You may not have a job like this, but whatever you have, don't go "nutty" over the amount of time your men lose in using the ordinary wrench. AND DON'T OVERLOOK IT EITHER.

Every construction job has a lot of work to be done with wrenches. Yours is no exception.

Pay day? To-day and once every week for the men. There's only one pay day to the Lowell Wrench and that's when you buy it. After that, IT'S ALWAYS PAYING YOU.

Think it over. Send for our Catalog M and look that over. SAVE TIME AND YOU SAVE MONEY.

LOWELL WRENCH CO.
54 Commercial St.
WORCESTER, MASS.

DIETZ LITTLE GIANT

Burns 70 Hours Without Refilling

A WHITE light at danger points is a presumption that all vehicle drivers are good guessers.

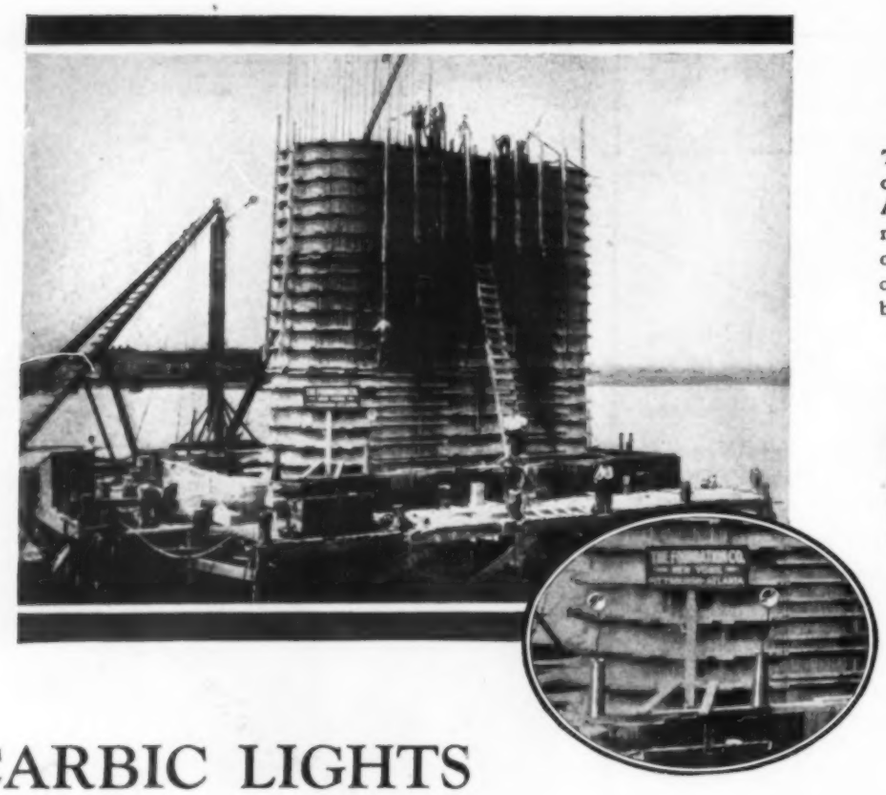
Dietz Red Globed Lanterns, on the contrary, shout !STOP! in every language. They are like Exclamation Points as opposed to Question Marks.

Dietz Little Giants provide dependable protection against accidents. They burn 70 hours without attention—over week-ends or holidays.

Try Little Giants! Get them from your supply dealer.

R. E. DIETZ COMPANY
NEW YORK
Largest Makers of Lanterns in the World
FOUNDED 1840

DIETZ LANTERNS



Style No. 2

This popular model weighs only 115 pounds fully charged. Anyone can charge it in a few minutes. It furnishes plenty of light for 25 to 30 men to operate under. One full charge burns for twelve hours.

CARBIC LIGHTS

are standard equipment with the

Foundation Company

THIS internationally known organization builds foundations for all types of heavy construction—large office buildings, factories, bridges, etc. Because of the nature of their work, operation at night is frequently required.

The Foundation Company has found that Carbic Flood Lights are just what they need. A supply of these portable lights is always kept on hand.

Carbic Lights make night work safer and more productive. Thousands of Carbic Lights are being used by contractors, railroads, utilities, and mines. Your jobber can supply you.

CARBIC LIGHT

OXWELD ACETYLENE COMPANY

Unit of Union Carbide and Carbon Corporation

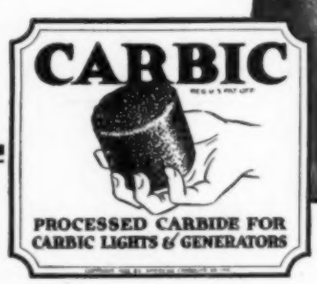
New York City
30 East 42d Street

UCC

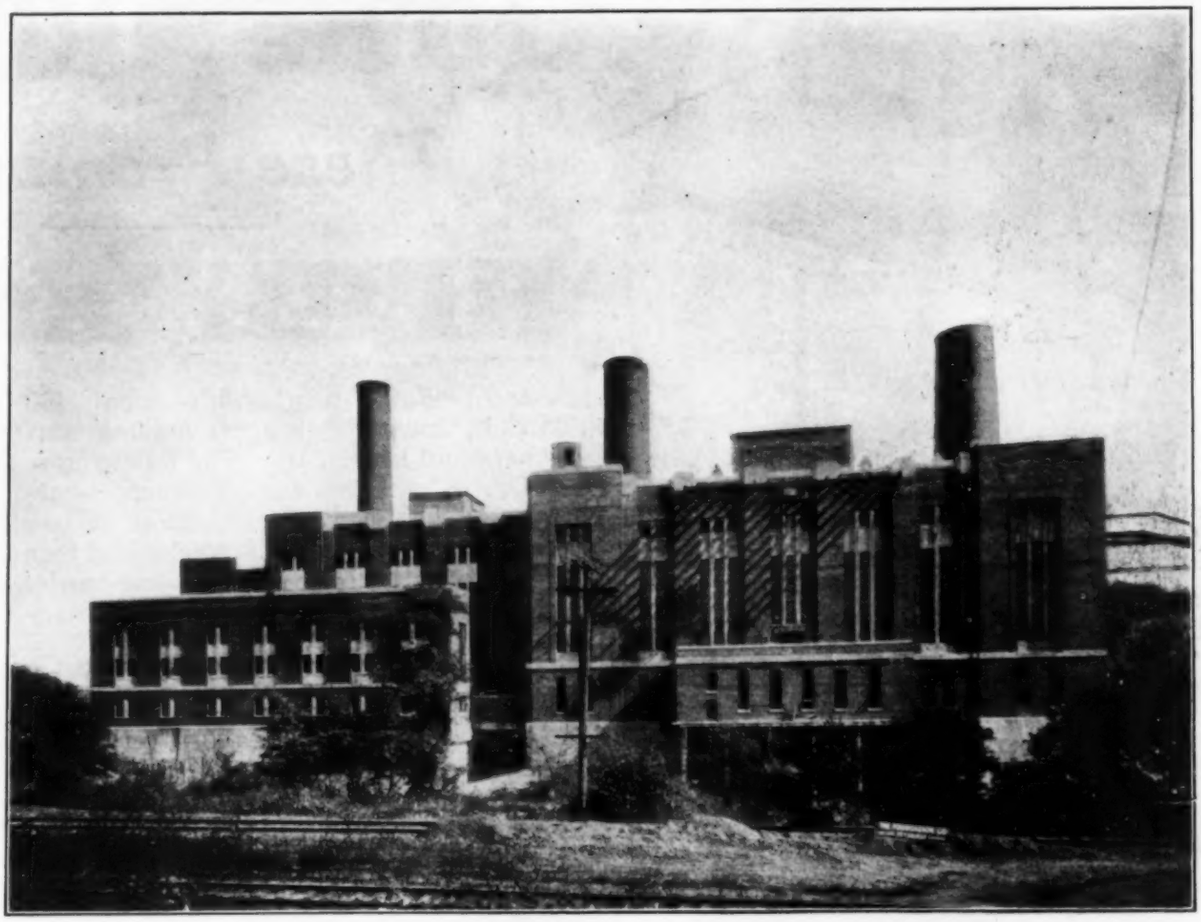
Chicago
Peoples Gas Bldg.

San Francisco, Adam Grant Building

Carbic is distributed by the Union Carbide Sales Company through its national chain of warehouses and is sold by jobbers everywhere.



Style No. 2



Philo Plant Extension — ***Philo, Ohio***

The Ohio Power Company
Sargent and Lundy, Engineers
The Foundation Company, General Contractor

The Philo Power Station Extension, of the Philo Power Company, on the Muskingum River in Ohio, is nearing completion. The first section was constructed in 1924, by The Foundation Company, and when the second section was required to meet the increased market, The Foundation Company was again awarded the contract for construction.

THE FOUNDATION COMPANY

CITY OF NEW YORK

Office Buildings - Industrial Plants - Warehouses - Railroads and Terminals - Foundations
Underpinning - Filtration and Sewage Plants - Hydro-Electric Developments - Power Houses
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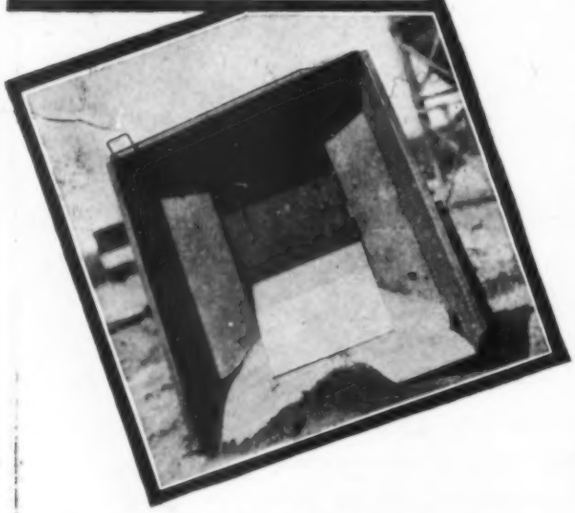
ATLANTA	CARTAGENA	LONDON	MADRID
PITTSBURGH	LIMA	PARIS	ATHENS
CHICAGO	LA PAZ	BRUSSELS	MONTREAL
SAN FRANCISCO	BUENOS AIRES	ROME	TOKYO

BUILDERS OF SUPERSTRUCTURES AS WELL AS SUBSTRUCTURES



Top picture: L. G. Carey's "Iron Mules" working on 110,000 yard dirt moving contract which was completed in ninety days. Note in bottom picture apron that insures an absolutely clean dump.

At The "IRON

These Prominent

"HERE" and

Eight---teen! Four---teen! Thir---teen! E---leven! And so right down the line dirt moving contractors answer here and how many. The following is only a partial list of dirt moving contractors who have bought 3 or more "Iron Mules"—those lively hell-for-leather units that are making trucks and teams look like liabilities when it comes to cost-per-load dirt moving on short hauls.

A FEW OWNERS AND USERS OF THE "IRON MULES"

Name and Address of Owner	Number of "Mules" Purchased
W. F. Allen Co., Clarksburg, W. Va.	3
Condon & Cole, Galt, Iowa	15
O. T. Balmat & Son, Clear Lake, Ia.	9
J. H. Miller & Son, Leon, Ia.	18
Nelson, Mullen & Nelson, Minneapolis, Minn.	9
J. T. Ryan, Garber, Iowa	4
Stevens Brothers, 612 Endicott Bldg., St. Paul, Minn.	13
Yant Construction Co., Verdon, Neb.	8
N. B. Burton, 20 Clitheral Ave., Montgomery, Ala.	3
Brewer & Brewer Sons Co., Chillicothe, Ohio	8
Boddie & Powell, Madisonville, Ky.	3
L. G. Carey, Lakewood, Ohio	12
Clay County Court, Otter, W. Va.	3
J. E. Hawkins, Gastonia, N. C.	4
Holmes Construction Co., Wooster, Ohio	11
Kremer & Hog, Aitkin, Minn.	5
Samuel Konigsberg, 20 E. 34th St., Bayonne, N. J.	3
International Excavating Co., 4 Fleming Ave., Newark, N. J.	6
Delford Building Corporation, Central Ave., Hackensack, N. J.	3
Benjamin Foster Co., Davidsburg, Pa.	3
J. J. & M. S. Mergens, 400 Gateway Bank Bldg., Minneapolis, Minn.	10
State Highway Department M. L. Pearce, Creola, Ohio	3
Lee J. Smith, Asheville, N. C.	3
Studer & Manion Co., Inc., Excelsior, Minn.	5
Ray Strauser, Columbus, Ohio	4
John Oman, Jr., Nashville, Tenn.	3
Utah Construction Co., Pine Bluffs, Wyoming	4
E. D. Wahl, Victor, Iowa	3
Colonial Construction Co., Pittsburgh, Pa.	6
Higgins—Dyer Company, Granite City, Ill.	12
Stigall Construction Co., Springfield, Mo.	8

The Hughes-Keenan

HUGHES-KEENAN

The Original

Powered By

McCormick-Deering

1929
CONVENTION &
ROAD SHOW
A.R.B.A.
JAN. 14 - 18
CLEVELAND, O

"IRON MULE" Muster

Contractors Answer

"HOW Many"

Name and Address of Owner	Number of "Mules" Purchased
Williamson, Howard & Smith, Youngstown, Ohio	5
Kelly & Young, Frankfort, Indiana	4
Platt-Rogers, Inc., Denver, Colo.	13
Davis-Pace Co., Dallas, Texas	5
Ford Motor Co., Dearborn, Mich. (In use on plantation in South America)	5
Sam B. Boyd, Kosciusko, Miss.	3
Bricon Construction Co., North Creek, N. Y.	5
Gaines Bros. Contracting Co., Quincy, Illinois	7
Sam Commodari Construction Co., Combs, Kentucky	4
Muir-Hill Engineers, Ltd., Manchester, England	8
W. H. Armstrong & Co., Fairmont, W. Va.	4
Schreier Bros. Contracting Co., Naples, N. Y.	5
Codell Construction Co., Winchester, Ky.	14
Marion Construction Co., Guthrie, Kentucky	4
Babcock, Boomer & Babcock, Minneapolis, Minn.	8
R. E. Martin, Denver, Tenn.	8
Mannix & Owens, Rm. 1, Mackie Blk., Calgary, Alta., Canada	4
Reimann-Hummel Corporation, White Plains, N. Y.	5
The Miller Contracting Co., Carrollton, Ohio	5
George B. Herring & Son., Mansfield, Ohio	5
Griggs & Anderson, Millersburg, O.	4
B. B. Boyd, San Diego, Calif.	4
Alabama Southern Construction Co., Ft. Lauderdale, Florida	6
T. B. Gatch, 5937 Belair Road, Baltimore, Md.	3
Eastern State Penitentiary—Gratersford, Pa.	12
Englehart Paving Construction Co. Eureka, California	9
State Highway Commission of California	45
George Pollock, Lafayette, Cal.	3
T. L. Smith, E. Akron, Ohio	4
Crawford & Simmi, Buffalo, N. Y.	3
Louis Gipp, North Tonawanda, N. Y.	3
Bill Ross, Newton, Iowa	5
V. Lundeen, Missouri Valley, Iowa	5
Ben Hanas, Keokuk, Iowa	5
T. C. Stoddard. Mason City, Iowa	5

AS WE have said: "It is only a partial list but it makes a 'Big Parade' of dirt moving contractors who are convinced that 'Iron Mules' have all other dirt moving equipment licked easy when it comes to profit producing performance."

Go and see an "Iron Mule" in action. We will send you a name of contractor near you if the Muster doesn't show one.

The "Iron Mule" works with grader, steam shovel and drag-line. Bottom picture shows ease of dumping in tight corners.

Company, Mansfield, Ohio

"IRON MULE"

TRADE MARK REG. U. S. PAT. OFF.

Tractor Dump

The Famous 10-20 Tractor

1929 CONVENTION & ROAD SHOW A.R.B.A. JAN. 14 - 18 CLEVELAND, O

Proving the judgment of Foote

Over two years ago the Foote Company announced a new trend in paver design and construction—Timken Anti-Friction bearings.

Today Anti-Friction bearings have been incorporated in the construction of every paver on the market!

—but Foote led the way!

The Foote Company, Inc.

of Nunda, N. Y.

World's largest exclusive builders of road pavers

MULTIFOOTE

The Paver with Timken Bearings

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152 W. 42nd Street
New York City

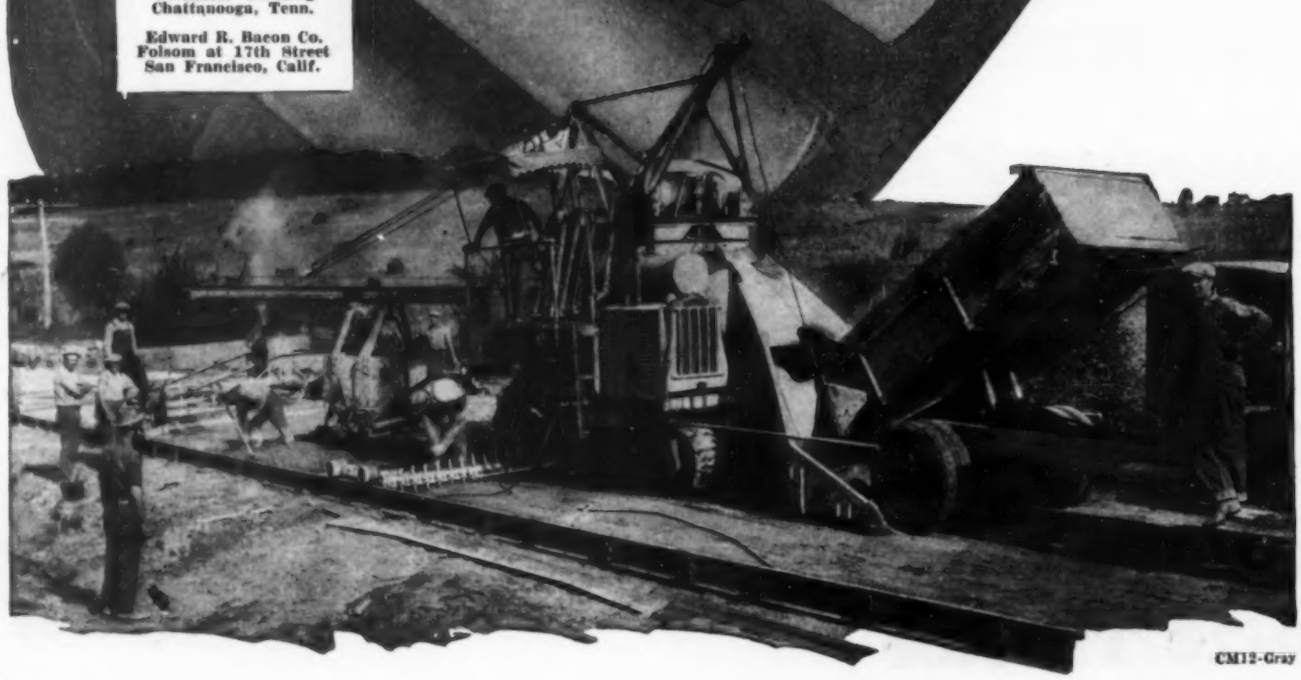
E. J. McHarg & Co.
31 Crestmont Road
Binghamton, New York

Wilcox Brothers, Inc.
588 Chenango Street
Binghamton, New York

MultiFoote Sales Co.
2811 West Fulton Street
Chicago, Illinois

Burton Franklin
Volunteer Building
Chattanooga, Tenn.

Edward R. Bacon Co.
Folsom at 17th Street
San Francisco, Calif.



CM12-Gray

BAKER *Dependable* EQUIPMENT

for Earth Moving, Road Maintenance, Snow Moving

You will get better results with Baker Products whether you use them for earth-moving, road-maintaining, bulldozing or snow moving. They are built to do things better, to last longer and show a saving in operation.

For instance, *Baker Maney Self-loading Scrapers*, the first successful self-loading scrapers of large capacity, have put the train method of earth moving on the map to stay. *Baker One-Man Automatic Rotary Scrapers* are proving out to be the cheapest and fastest method for short hauls. *Baker One-Man Automatic Road Maintainers* are demonstrating daily how easy it is to make smooth roads, once over. *Baker Bulldozers* and backfillers are making new records in pushing dirt over fills, backfilling and spreading material. *Baker Snow Plows*, in over twenty models, continue to show their superiority in every part of the snow belt.

Get acquainted with Baker Equipment
Use the coupon in requesting information.

BAKER MANEY SCRAPERS

Made in 3 sizes—¾ yd., 1 yd., 1¼ yd. for use with heavy tractors.

BAKER ROTARY SCRAPER

Made in 4 sizes with capacities from 13 to 40 cu.ft. for any tractor.

BAKER SNOW PLOW

Made for attachment to standard motor trucks and leading industrial tractors in V and blade types.

BAKER BULLDOZER

Made for attachment to leading tractors with both hand and hydraulic power lifts.

BAKER ROAD MAINTAINER

Made in three models with steel or rubber tired wheels. Scarifier attachment extra.

☐ **See Baker Equipment at 1929 Road Show** ☐

Cleveland, O., Jan. 14th to 18th, incl.

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The Baker Manufacturing Co., 568 Stanford Ave., Springfield, Illinois, U.S.A.

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Please send literature and prices on items checked to

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(568)

- ☐ Baker Maney Scrapers
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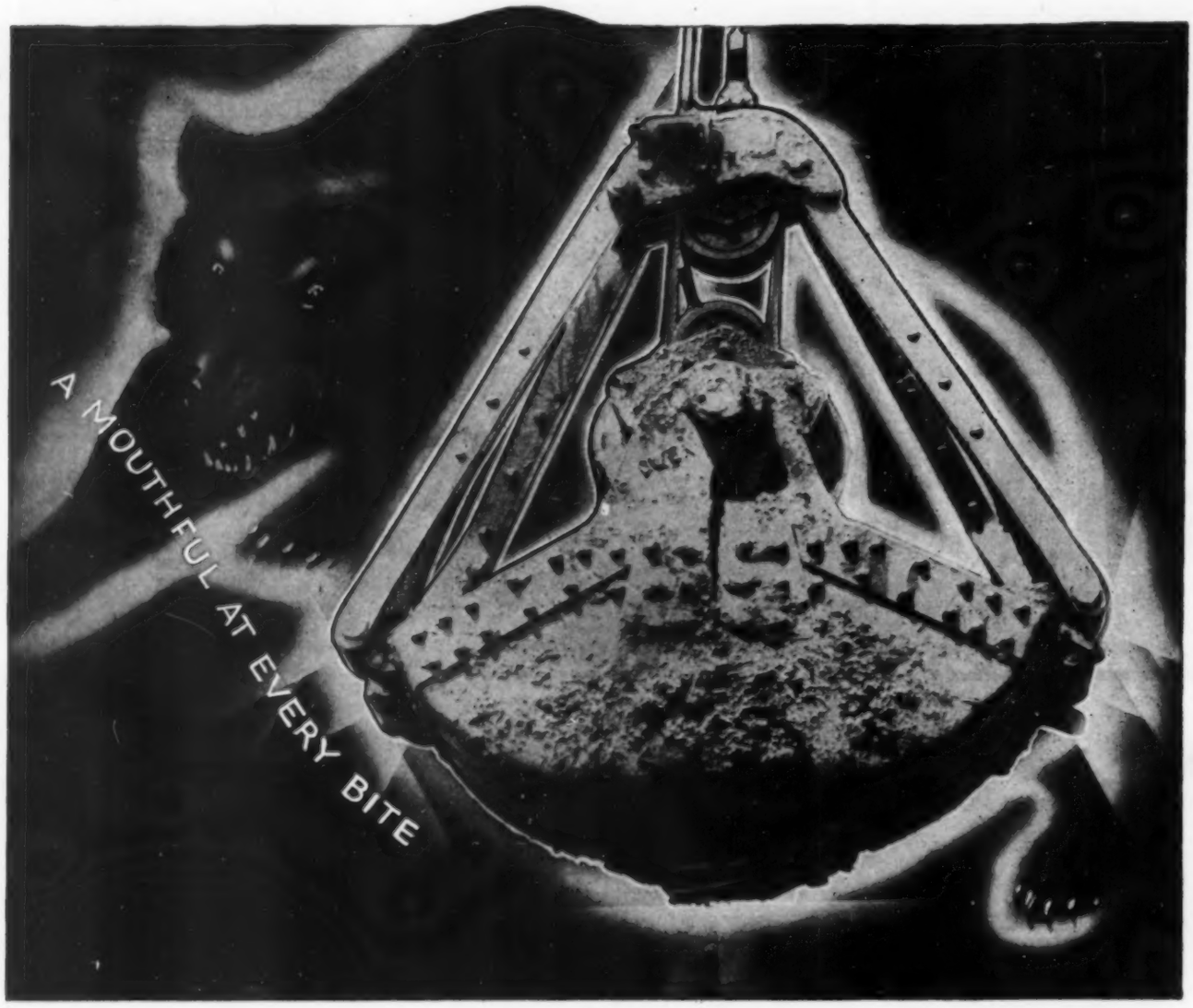
- ☐ Baker Bulldozers
- ☐ Baker Road Maintainers
- ☐ Baker Snow Plows

Heavy duty and hard work as daily routine—that's the life for which the rugged Owen Type "D" Bucket is built. Exceptional strength in every part fits it for difficult digging in hard stuff. Unusual resistant qualities give it stamina to withstand the severe shocks and strains encountered when working in heavy coarse materials—such as ore, slag, broken rock, stiff clay, shale and large gravel. It gets its "Mouthful at Every Bite" in any kind of material and under the most difficult conditions.

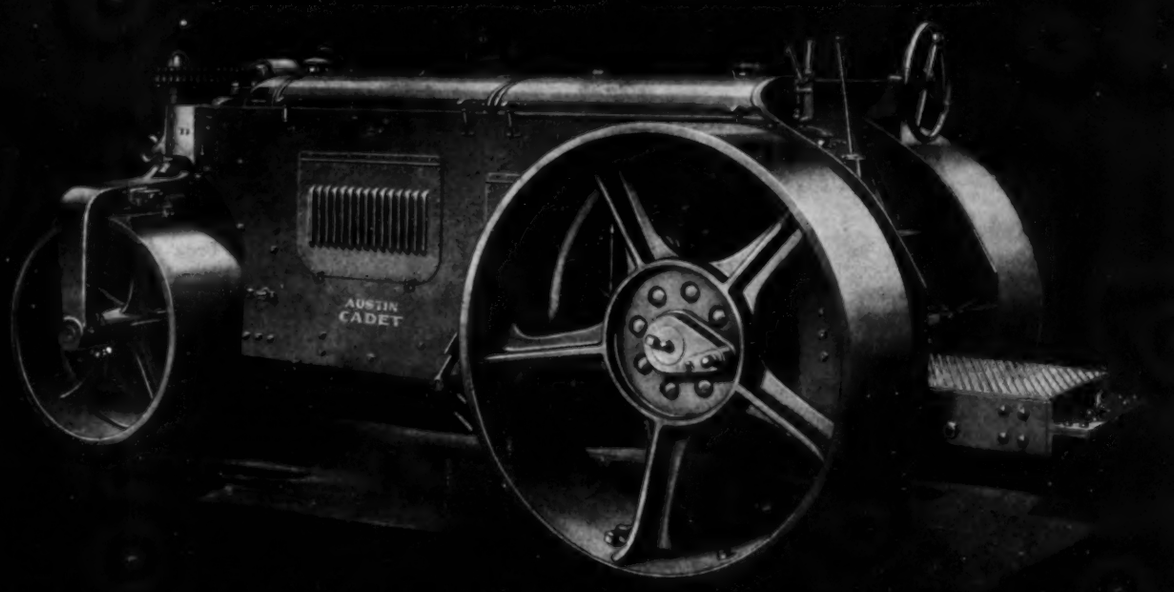
The Owen Type "D" Bucket is dependable and durable—it's another staunch supporter of the Owen Guarantee, "A bigger day's work than any other bucket of the same weight and capacity." The Owen Catalogue explains and illustrates the complete line of Owen Buckets — Send for it. The Owen Bucket Company, 6021 Breakwater Ave., Cleveland, Ohio.



OWEN CLAMSHELL BUCKETS INSURE A BIGGER DAY'S WORK

Owen Buckets

The Austin CADET



THE AUTOCRAT OF PUP ROLLERS

A finer and more efficient small roller

by the makers of the country's first Pup-sized rollers

The Austin Cadet roller is a completely factory built model patterned after the famous 10 ton Austin Autocrat. It has features possessed by no other Pup-sized rollers that make it particularly fit for modern road construction work.

A wheelbase of 8 ft. 11¾ in. permits the Cadet greater freedom of operation between the forms of concrete roads and in many other places where quarters are cramped. The stream line design gives the operator an unobstructed view of his work at all times. The high side frame plates and the two easily removable top housings are of sufficiently heavy material to withstand severe service indefinitely without losing their shape or rattling.

The Cadet comes in 5, 6 and 7 ton sizes. The famous Austin front planing blade with controlling runners can be fitted to any size.

A very efficient pneumatic scarifier similar to that on the Autocrat can also be supplied. The 4 cylinder Buda motor can be cranked from either side and provides ample power for leveling rough sub-grades and scarifying. The special Cadet transmission gives the same three traveling speeds forward and reverse—impossible where standard tractors are used for power plants.

All transmission gears are enclosed and run in oil.

Write for literature and complete specifications on this newest time-and money-saving road builder.

See Us AT THE CLEVELAND ROAD SHOW JAN. 14-18 1929

THE AUSTIN-WESTERN ROAD MACHINERY CO.
400 N. Michigan Ave., Chicago, Ill., U. S. A.
Branches in principal cities.

Austin-Western
ROAD MACHINERY

This Hotel Was Built During Winter Months with the Aid of "ANTI-HYDRO"

ANTI-HYDRO
FOR PERMANENT CONCRETE
HARDENS WATERPROOFS

Freezing weather did not interrupt the work on this building because "ANTI-HYDRO" was added to the brick mortar as well as the cement plaster coat and floor topping of the basement and boiler room.

In addition to preventing the mortar and concrete from freezing, "ANTI-HYDRO" produced a stainless mortar and eliminated the possibility of efflorescence appearing on the brick work. It made a waterproof basement, guaranteed for five years by the manufacturers.

"ANTI-HYDRO" has many advantages for cold weather work. It permanently waterproofs, damp-proofs and hardens portland cement mixtures *in one operation*. It also lowers the freezing point to 15 deg. F., and enables you to work right on through extremely cold weather without delays.

Being a liquid integral compound "ANTI-HYDRO" is extremely easy to use. It mixes readily with the water used in wetting down concrete—without the aid of skilled labor. For 24 years "ANTI-HYDRO" has been the accepted standard. Use it on your next job.

ANTI-HYDRO WATERPROOFING Co.

265-295 Badger Ave.
Newark, N. J.

HOTEL SUBURBAN, EAST ORANGE, N.J. E.V. WARREN, Archt. HARRY KRUVANT, Builder

ACCEPT NO SUBSTITUTE

Sterling barrows wheel easier because of their "self-lubricating" axle bearing. The axle assembly is unusual—the wheel revolves on the bearing—the bearing on a fixed, axle keyed to malleable iron brackets.

Sterling

"perfect balance"—the load is carried *over the wheel*—not on the arm.

More capacity loads per man per day—means more work—more profit. This is one of the many reasons why Sterlings are found on more jobs. With a Sterling the man *pushes* the load—not *carries* it. This feature is not found in ordinary barrows—and it is possible in a Sterling only because of scientific designing of tray and supporting braces. Try them on your next job.

Leading Hardware and Equipment dealers have them—or they can get them quickly from our complete stock warehouses at Chicago — New York — Philadelphia — Pittsburgh — Cleveland — Detroit — St. Louis.

STERLING WHEELBARROW COMPANY

STERLING ON A WHEELBARROW MEANS MORE THAN STERLING ON SILVER

Milwaukee Wisconsin

THE ELECTRONIC TORNADO

A process of automatic arc welding which represents a distinct advance in the welding art

THE Electronic Tornado Process of automatic carbon arc welding is now available for manufacturers of tanks, boilers, steel pipe and any products where steel is to be joined to steel on a production basis.

We shall welcome an opportunity to prove that welds made by this process develop greater strength and are more ductile than welds made by any other commercial process . . . that welding speeds are greater than by other welding methods . . . that the process is adaptable for either light sheet or heavy plate . . . and that the cost is lower than by any other known method.

Since welding speeds are high the cost per foot of weld is low. On ½ inch plate the rate of welding is 25 feet per hour.

The crystalline structure of welds made by the Electronic Tornado Process is remarkably fine and uniform and the metal in the weld is actually superior to the parent metal.

Microphotographs of sections through the fusion zone show a gradual transition from the crystalline structure of the parent metal to that of the weld metal. In no place is the metal weakened by the welding process.

Space does not permit a description of the process itself. However, a descriptive bulletin covering the Electronic Tornado is available and will be sent on request.

J. F. Lincoln

Vice President and General Manager

THE LINCOLN ELECTRIC COMPANY

CLEVELAND, OHIO

NOW, *the* HAUCK

Oil Burning Water Heater

Burns Kerosene or Furnace Oil

For Winter Construction Jobs such as concreting, mortar mixing, etc., where hot water is essential.

Heats 300 gallons of water per hour from 40° to 180° F. Water at 180° F. three minutes after starting and continuous thereafter.

Heater is furnished complete and ready to attach to water supply line. Put in operation in 5 minutes.

Write us about it.

Made by the manufacturers of the well-known Hauck Kerosene Burning Concrete Heaters, Thawers and Oil Burning Salamanders.

HAUCK MFG. COMPANY

Established 1900

147 Tenth Street, Brooklyn, N. Y.

52 Tons Over Rough Mountain Roads

AMERICAN ROAD BUILDERS ASSOCIATION
1929 CONVENTION AND ROAD SHOW JANUARY 12 TO 18 INCLUSIVE CLEVELAND OHIO

FIVE trucks were required to propel this 52-ton transformer over mountain roads, yet the 28-ton Rogers Trailer withstood the enormous overload without the slightest difficulty.

Rogers Trailers are built to withstand the severest service, to steer easily and to serve satisfactorily for years to come with the lowest known tire upkeep expense.

Our new Catalog gives all the facts.

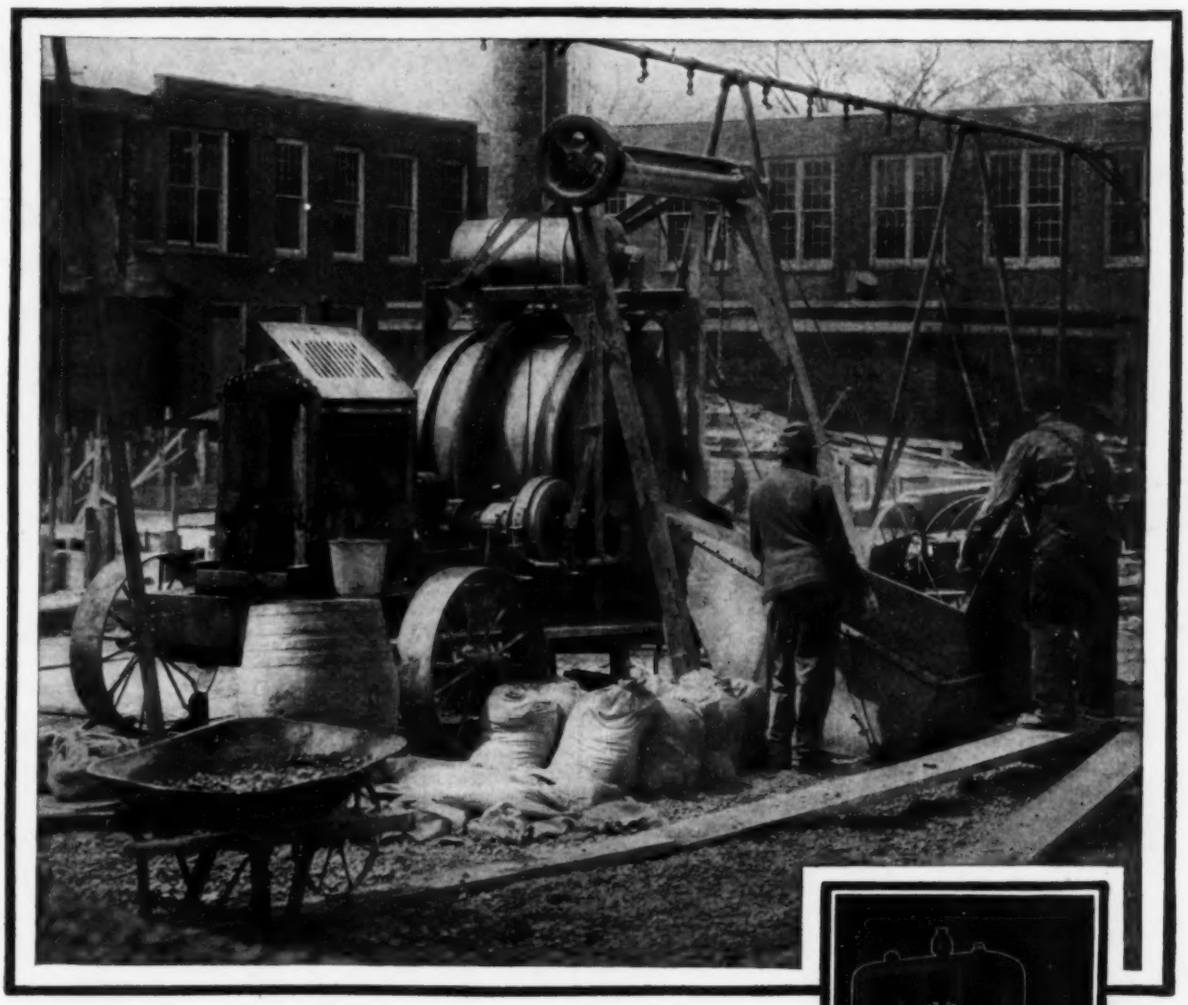
ROGERS TRAILERS

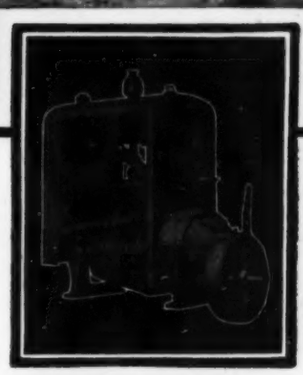
GOOSE NECK **HEAVY DUTY**

ROGERS BROTHERS CORPORATION

106 Orchard St., Albion, Penna.

TEN YEARS OF *faultless operation*





EARLY in 1918—the O. F. Miller Co. of Kalamazoo, Mich., played a "hunch". They wanted a 4 cylinder gasoline engine to use on a mixer. They scanned the field of engines and *gambled on a Le Roi.*

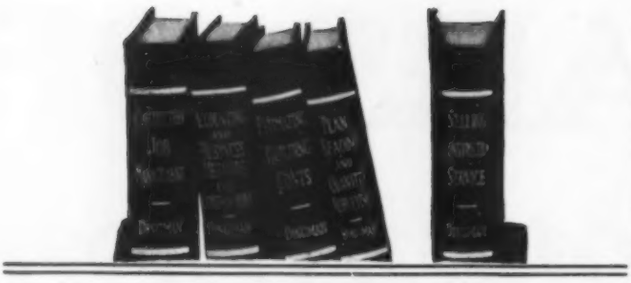
Now,—in 1928—Mr. Miller says: "And at this time after 10 years of wonderful service, the Le Roi Engine functions as faultlessly as the first day it was used". That's typical of Le Roi Engines, long lived and dependable—and more—lowest operating and maintenance costs per day and per year. *Know the Le Roi by what it does.*

LE ROI COMPANY, *Milwaukee*

1929 ROAD SHOW
Cleveland
Jan. 14

LE ROI ENGINES

3 *to* 160 HORSE POWER



The Dingman BUILDING CONTRACTORS' POCKET BOOK LIBRARY

Make your costs come down and your profits go up!

HERE is a set of books that is packed to the covers with plans and methods for saving Time, Money, Materials and Labor. The five books cover every phase of practical construction work from estimating building costs to the selling of construction service—from plan reading and quantity surveying to practical job management. With these books, the contractor and construction superintendent can make costs come down and profits go up!

5 handy pocket size volumes

The Dingman books have won a wide reputation among builders and building contractors for their sound, practical and easy-to-understand discussion of building construction work. All of the material has been drawn from actual practice.

This library is intended for:

(1) The building contractor who wants a handy reference set that will give him almost instantly a ready answer to most of the problems that come up in the course of the day's work.

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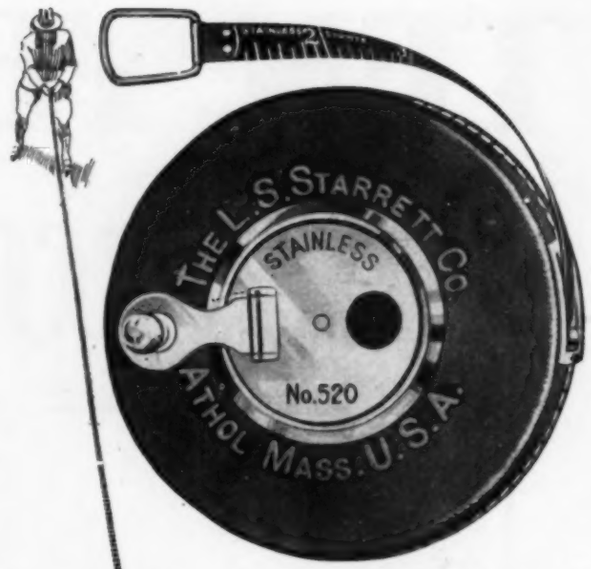


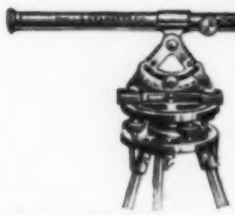
Easy to read

The Starrett Transit No. 99F is a simple but accurate instrument that can be successfully operated by any practical man. For foundation work, ditches, roads, etc., it is just the thing. Complete with telescope, extension legs, ground level vial and handy wood case it costs only $40.00. Write for free copy of our illustrated Starrett Transit Book.

Starrett Stainless Steel Tapes do not rust. A quick run of the ribbon through a cloth to remove any mud or grit is all the attention a Starrett Stainless Steel Tape ever requires. The figures stay as bright and clear as new.

Ask your dealer to show you the Starrett No. 521 Stainless Steel Tape graduated in feet, tenths and hundredths of a foot, and the No. 520 Tape with feet, inches and eighths of an inch graduations. Both may be had in 50 and 100 ft. lengths. Write us for further information and free copy of the Starrett Catalog No. 24 "NF."

THE L. S. STARRETT CO.
World's Greatest Toolmakers
Manufacturers of Hacksaws Unexcelled
Steel Tapes—Standard for Accuracy
ATHOL, MASS., U. S. A.



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Telescope, extension legs, ground level vial. $25.00

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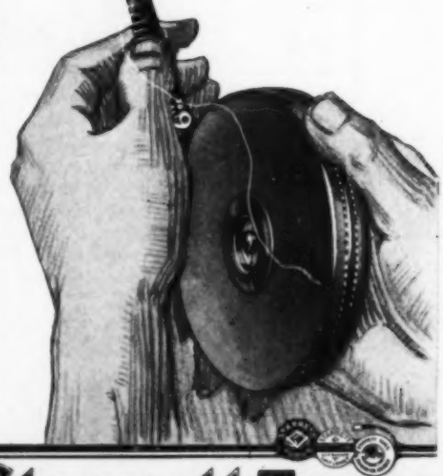

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825 NET TONS PER DAY ON 8 TO 10 GALLONS OF GASOLINE

A FULL RANGE OF SIZES FROM 2 to 60 TONS

If it's a Track Haulage Problem There's a PLYMOUTH to Solve It

W. E. SEXTON
ENGINEER
ALLIANCE, OHIO
July 2, 1928

Mr. George G. Stein,
Fate-Root-Heath Co.,
1008 Fidelity Mortgage Bldg.,
Cleveland, Ohio.
Dear Sir:

The Plymouth locomotive which we are using on the Alliance Sewage Treatment Works is performing very satisfactorily. It is handling fifteen carloads of crushed limestone in a nine-hour day, using only eight to ten gallons of gasoline.

We are confident that this method, using narrow gage track and cars, is more economical than the alternate method, a belt conveyor, on this contract.

Very truly yours,
W. E. SEXTON
By James V. McLaughlin

To distribute 500 car loads of lime stone necessary to fill the filtration beds at the Alliance Sewage Treatment Works, this 4-ton Plymouth Gasoline Locomotive worked nine hours per day over a 350 foot track, having a seven per cent grade and a thirty-five foot radius curve, hauling three dump cars or a total load of seven tons.

Mr. James V. McLaughlin, in charge of this work for W. E. Sexton, Mineola, L. I., New York, says he is confident that Plymouth haulage here was more economical than the belt conveyor method.

PLYMOUTH LOCOMOTIVE WORKS
The Fate-Root-Heath Company
299 Riggs Avenue, PLYMOUTH, OHIO

PLYMOUTH
Gasoline and Diesel Locomotives

OIL BURNING WATER HEATERS and SALAMANDERS

For Winter Construction Jobs

This coil-type water heater supplies a continuous stream of hot water within 5 minutes after starting the oil burner. Burns kerosene or furnace oil and can be used for heating compressed air or as a "Smokeless" Salamander.

Can also be furnished without oil burner for burning coke, coal or wood.

Send for a copy of our 16 page bulletin No. 72-M giving full information, specifications and prices on Water Heaters, Concrete Heaters, Salamanders, Car Thawing Outfits and Thawing Torches.

AEROIL BURNER CO., INC.

563 Park Avenue, West New York, New Jersey

SAFETY IN UNDERPINNING

Is assured by use of

Watson-Stillman Independent Pump Hydraulic Jacks

Accurate—Dependable—Easy to Repair

These Jacks are being used extensively by Underpinning and Foundation Contractors for underpinning work, sinking piles under foundations and making tests of footings

THE WATSON-STILLMAN CO.

1014 Evening Post Bldg., New York City

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For the man who borrows your copy of "CONSTRUCTION METHODS"

We all know him. He doesn't mean to bother you. He really means it when he says he'll return your copy.

But you know that, for some reason or other, he seldom does.

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ENTER MY 2-YEAR SUBSCRIPTION TO
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The Porter Gasoline Electric Locomotive is a modern masterpiece of mechanical and electrical engineering—a powerful unit in every respect worthy of the name Porter and a fitting companion to the world famous Porter Steam Locomotive.

This new Porter Locomotive is driven by the smooth power impulse of four electric motors energized by two gasoline engines, and possesses the most powerful tractive force of any type of industrial locomotive yet built.

It is particularly advantageous over steam locomotives in localities where water is scarce or unsuitable for boiler use and for this reason meets a long felt want for a Porter-built locomotive with these qualifications.

H. K. PORTER COMPANY, Pittsburgh, Pa.

Established 1865

Chicago Office: Engineering Building, Wells Street and Wacker Drive
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PORTER
GASOLINE-ELECTRIC
LOCOMOTIVES

More for Your Mixer Dollar *any way you figure it*

MARSH-CAPRON 10-S

Marsh-Capron *Concrete Mixers*

The quality of Marsh-Capron mixers is established. We don't have to tell you how fast and how dependable they are on large or small jobs—you know what they are from actual use or from reputation. Our only trouble in selling Marsh-Capron Mixers is the FALSE IMPRESSION that they are High Priced. The true facts are that they are LOWER PRICED than SOME MIXERS and no higher than other standard makes.

CONSTRUCTION MACHINERY COMPANY
WATERLOO, IOWA
Plants at Waterloo and Chicago Heights, Ill.

Construction Machinery Co., 448 Vinton St., Waterloo, Iowa.
Send Details of Marsh-Capron
Mixers .....Size ..... Type .....
Name .....
Street .....
City .....

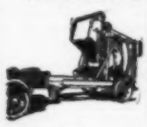
Jaeger Heavy Duty 10 S Holds 2 Bags *Built of Steel - ½ ton lighter, 50% stronger*

AUTOMATIC SKIP SHAKER
Stops that man from pounding loader out of shape.

100% BALL BEARING

Fast - Portable - Sturdy

Skip Shaker loader, remixing drum action, Accurate Measure Water Tank and fast discharge (8 to 11 seconds) mean more thoro mixed concrete per day. Machined steel tracks, chilled ground faced rollers and ball bearings save power, save wear. Direct drive, one man control, dual tires for soft and hard ground.
Get our new low prices, terms on tilters or non-tilters, 3½ to 28 ft. sizes. OK'd by over 75,000 users.



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THE JAEGER MACHINE CO.
800 Dublin Avenue, Columbus, Ohio

Used and Surplus Equipment

INDIVIDUAL items of used equipment, or surplus new equipment, or complete plants, are disposed of (and found) through advertising in the *Searchlight* Section of this paper.

This is the section which so effectively aided the Government in selling the many millions of dollars worth of surplus material and equipment accumulated during the war without disturbing the market.

"SEARCHLIGHT"

SAFE!

after record downpour

ANOTHER striking illustration of how Bates Bags prevent loss! On July 7th last, shortly after Hibbler-Barnes Co. of Chattanooga delivered the 200 bags of plaster shown above, they were hit, uncovered, by a cloudburst—2 inches of rainfall in one hour! Mr. John A. Maycann, Secretary-Treasurer of Hibbler-Barnes Co., writes, in sending the photograph:

"The broken bag in front was opened by our sales manager, Mr. Ramsey, who appears in the picture.

"There was not one pound of plaster damaged in the whole carload. The rainfall was the heaviest we have had in this section for a number of years. In fact, the whole lower part of the plaster above sidewalk level was entirely submerged."

Put your cement and plaster on a no-loss basis. Buy it in Bates Multi-Wall Paper Bags. Bates Bags save your money.

BATES VALVE BAG CORPORATION - 35 East Wacker Drive, Chicago, Ill.

BATES Multi-Wall PAPER BAGS

Bates Multi-Wall Paper Bags are made by the Bates Valve Bag Corporation in 9 modern plants throughout the country

LOCOMOTIVE – TRUCK – CRAWLER CRANES
GAS – STEAM – ELECTRIC

Let a Browning do it!

IF YOU have a handling job—let a Browning do it and save money!

There's a size and type for every conceivable kind of a job—giant steam or electric locomotive cranes for heavy duty work; steam or gasoline crawlers for medium duty service and speedy truck cranes for lighter duty when mobility is essential. Whatever *your* requirements, you can do it better—and faster with a Browning.

THE BROWNING CRANE COMPANY
16226 Waterloo Road
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Portland : Los Angeles : Montreal : Toronto
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A Browning Truck Crane owned by The Burger Iron Co., setting steel on The Akron Baking Co. Building

See our exhibit at the Road Show, January 14 to 18

BROWNING

This is Your Ticket

For a Free Tour of Over 50 Contracting Layouts

Here's a chance to make a free inspection tour of over 50 progressive contracting jobs, without going outside of your own door. Barber-Greene men have gathered information, pictures and layouts on interesting features of contracting work in every section of the country. The best of these have been collected in the 1927 edition of *Contracting with Barber-Greenes.* Sending this ticket brings your copy—send it today.

Name .....
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BARBER-GREENE CO. *Representatives* 530 W. Park Av., Aurora, Ill. *in Fifty Cities*

BARBER GREENE
Portable Belt Conveyors Self Feeding Bucket Loaders
Coal Loaders Automatic Ditch Diggers Coal Feeders

Leader of the Small Shovel Field
BAY CITY TRACTOR SHOVEL

Operates Shovel, Clam, Dragline or Trench Hoe
¾ swing—3 speeds—1 to 4 mi. per hr.

Speed! Capacity! Earning ability!

Other features include:—¾-yd. bucket; a husky McCormick-Deering Power Unit; Timken and Hyatt Bearings; big, *full crawlers;* one man operation; ten ton weight, scientifically distributed to insure correct balance—no counter-weights.

Our new catalog tells about the BAY-CITY'S features and why they reduce pit costs. Send for your copy now.

BAY CITY DREDGE WORKS :: Bay City, Mich.

BAY-CITY

Full or Part Circle Shovels—Cranes—Excavators

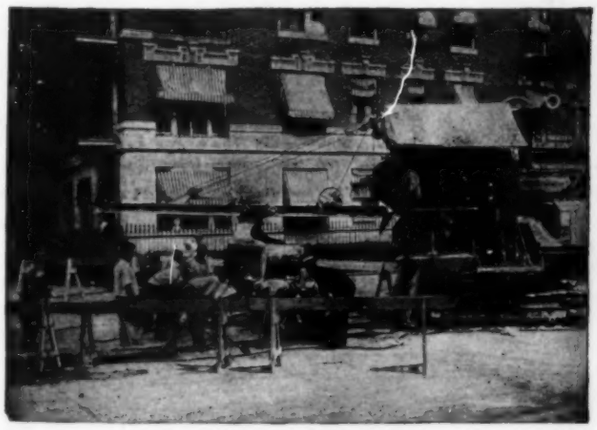
760,000 Detours *saved with* "INCOR"

HERE is convincing proof that "INCOR" solves the road building traffic problem.

An intersection had to be repaved on the Boston Post Road. It was at Echo Avenue, New Rochelle, N. Y., one of the most congested spots on America's busiest trunk highway.

Using ordinary concrete would have meant a detour for 20 days to allow the concrete to cure. All that time, 40,000 vehicles a day would have been compelled to make a swing-around. Only one day's traffic was detoured. "INCOR" concrete was placed on August 16. Exactly 24 hours later—at 3.10 P. M., August 17—the intersection was opened to traffic. Detouring of 760,000 vehicles and all the incidental traffic jams were avoided.

"INCOR", the perfected High-Early-Strength Portland cement, produces concrete ready to use in 24 hours. On the basis of performance, "INCOR" has earned the right to first consideration not only in highway work but in all other construction in which time is a factor.



3.10 P.M., August 16, 1928
Placing last section of "INCOR" concrete at Echo Avenue and Boston Post Road, New Rochelle, N. Y. An actual traffic check shows that 40,000 vehicles per day, each way, pass over the Post Road at this point.

24 hours later—3.10 P.M., August 17, 1928
Traffic passing over the "INCOR" intersection (view from opposite side of the street). A 30-ton steam shovel on a trailer passed over the intersection two hours after it was opened to traffic.

"INCOR" Perfected High-Early-Strength PORTLAND CEMENT

Made and guaranteed by the Manufacturers of Lone Star Cement

International Cement Corporation
342 Madison Avenue New York

One of the world's largest cement producers—13 mills . . . total annual capacity 20,000,000 barrels

SUBSIDIARIES

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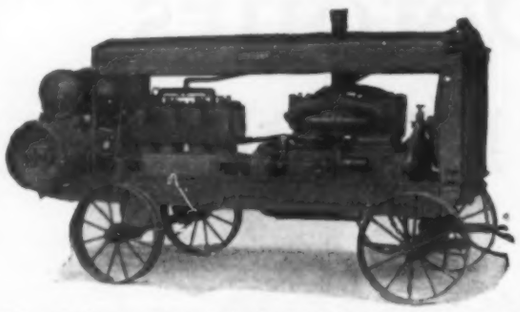


Price of above unit on steel wheels, f.o.b. factory, $3,500.00

AIR *for* the big jobs!

360 cu. ft. per minute

Built to faithfully perform its work day in and day out—with operating advantages that are worth your investigation.

Simple, large capacity compressor. Powerful, absolutely dependable Buda engine.

Self-aligning clutch feature for easy starting.

Gasoline strainer on gas line and air filters on both engine and compressor.

Pressure control—unloader pilot valve with special slow-down speed control during idling period.

There's a "SCHRAMM" compressor for every type of job and mounting requirement.

Ask for our 1928-29 Catalog for the whole story.

Sizes—2½ up to 360 cu. ft. Gas, electric or belt drive. Truck, trailer, skid or tractor mounted.

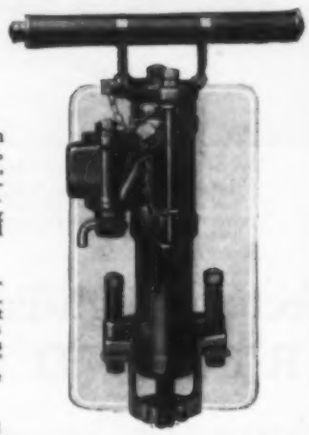
Get the Catalog

Schramm Inc., Manufacturers

West Chester, Pa.

Offices and Representatives in Principal Cities

Another New Sullivan Rotator —"L-8"



For general rock drilling on your road job, in your quarry, for any outdoor excavation, try Sullivan "L-8", 39-lb. Rotators. Their lightness, freedom from vibration, drilling speed and air economy will surprise you.

Built in solid or hollow piston, or water-tube models. "L-8" will drill to 14 feet for 1¼-inch powder. It cuts fast in hard rock, yet cleans the hole effectively. "L-8" has an added advantage where air economy is important.

"L-8" fits a cradle and shell mounting for tripod or bar drilling, and has shoulders which ride easily on a plank for flat holes.

"L-8" Features Include

Automatic rifle-bar rotation of the bit; improved drill steel retainer; Automatic lubrication, automatic ejection of cuttings from drill hole; cushioned return stroke; adaptability to use on mountings; simplicity, and convenience; drilling speed and power; selected steels and "Sullivan" standard rock drill workmanship, insuring uniform performance and low cost operation.

Ask for new Bulletin 7281-T.

SULLIVAN MACHINERY COMPANY

168 S. Michigan Ave., Chicago

SULLIVAN

Buhl

AIR COMPRESSORS

Below is illustrated the BUHL Type **C** Portable Compressor—one of the many different types of this popular line. Moderate in original cost and low in upkeep.

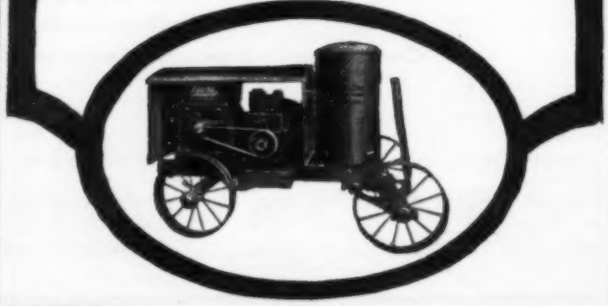
There are six sizes of portable air compressors in the BUHL line to choose from. For operating jack hammers, riveters, clay spades, concrete breakers, etc. The BUHL gives dependable air power at low cost—send for bulletins today.

Sales offices in principal cities

THE BUHL COMPANY

Manufacturers

37 W. Van Buren St., CHICAGO

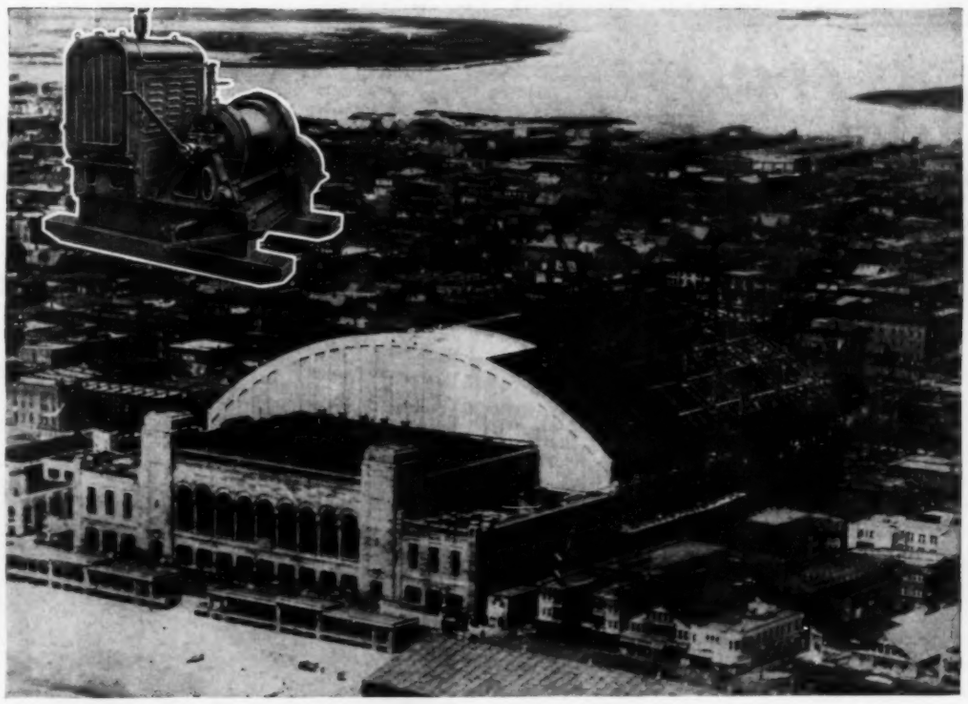


CLYDE

HOISTS CLYDE DERRICKS

The world's largest convention hall is under construction at Atlantic City, New Jersey. M. B. Markland Co. took over the general contract. Clyde equipment played an important part in the erection of the building as the Unit Construction Co. of Atlantic City, sub-contractors, used four 35 H. P. one-drum Clyde Gasoline hoists in handling all of the brick, tile and mortar for the job. You will find safety and efficiency built into every Clyde unit.

You'll Take Pride In Your Clyde!



CLYDE IRON WORKS SALES CO.

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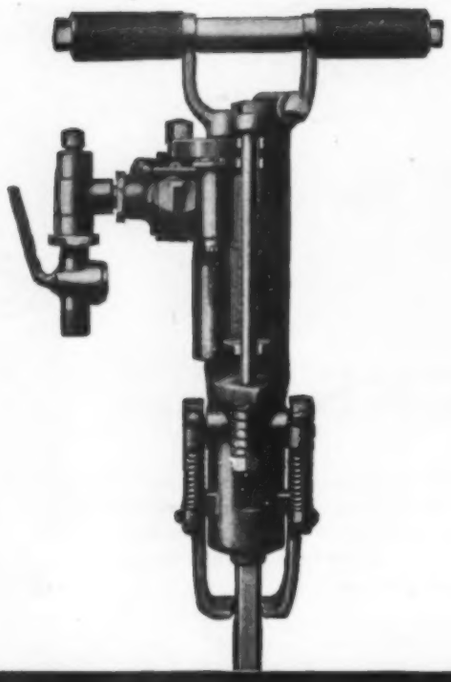
1325 STANDARD BANK BLDG.

CLYDE TWO MARKS OF GUARANTEED QUALITY

SUCCESSFUL PERFORMANCE FOR AGC of A.



On Any Drilling Job

It makes little difference to a Cleveland H-7 what the drilling task may be. In rock, reinforced concrete, or other material—*it's better on any job.*

Fast, powerful, with unusual hole cleaning ability, the remarkable Cleveland H-7 is unsurpassed for demolition work or general rock drilling.

A demonstration will prove a revelation. Let us show you, on your own work, what a Cleveland H-7 can do. Write—

The Cleveland Rock Drill Co.
3734 E. 78th St., Cleveland, Ohio

Branches, Agents and Service Stations in Principal Cities of the World
Complete specifications of Cleveland Drills on pages 150-151, Keystone Metal Quarry Catalog

CLEVELAND ROCK DRILLS

A Sensational Performer and Money Saver

THE speed, versatility, rugged construction, big yardage and low cost of the Fundom combination shovel, ditcher and crane, make it a sensational performer and money saver.

It makes small jobs profitable. Fast, full ¾ circle swing, 1/3 yard dipper capacity, 16½ foot radius, gasoline power.

With Trench Hoe attachment for ditching or Boom Extension for clamshell, dragline or crane, the Fundom is an unbeatable three-in-one digging machine.

Get the details and name of nearest dealer. Address—

The Fundom Hoist & Shovel Co.
407 American Bank Building, Lima, Ohio

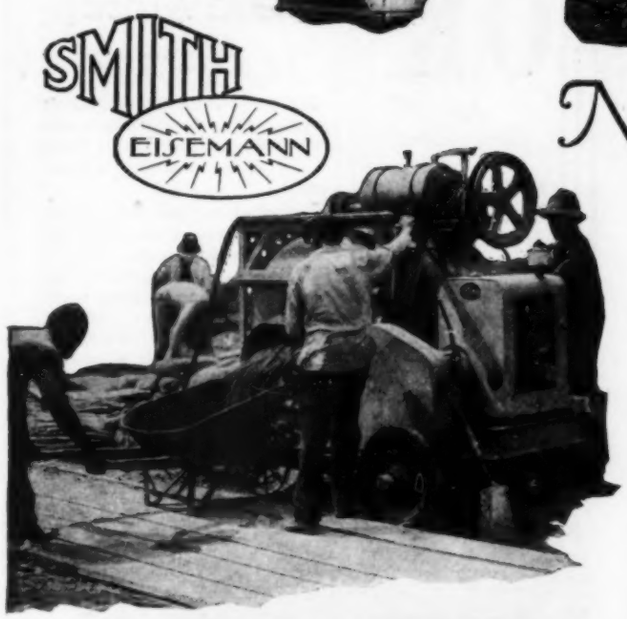
This one-man hammer for driving 2-in. wood sheeting weighs 97 lbs., strikes a 275-lb. blow at 550 per minute. A great time and money saver. Easy to operate and easy to move about. Compact and sturdy. No exposed valves or working parts.

For 3-in. wood sheeting, use the Junior Hammer, weighing 220 lb., delivering a 400-lb. blow at 450 per minute.

Other pile driving hammers up to 21,000 lbs. for steam or pneumatic operation.
Ten sizes to choose from.

UNION IRON WORKS
Lackawanna Siding, Hoboken, N. J.

SMITH
PAVERS & MIXERS
are Eisemann Equipped!



NOW Smith Mixers are Eisemann-equipped. And why?

Simply because quality is the prime consideration in the selection of magnetos by the T. L. Smith Company, and Eisemann Magnetos have been found more satisfactory than any other ignition system.

Dust-proof. Water-proof. Thoroughly reliable under all conditions. These are the features which make Eisemann the favored magneto among the builders of quality construction machinery.

EISEMANN

EISEMANN MAGNETO CORPORATION ~ 165 BROADWAY ~ NEW YORK

TRENCHMARINE
Portable Pumps

Dirty Water
Cannot Clog
These Pumps

This Pumper Cannot Freeze

Air cooled engine "nuf sed"

FOR pumping clean or dirty water from trenches, sewers, cellars, quarries, reservoirs, barges, ships and cesspools.

Self-contained, compact, light—easily transported, not too light for hard work, and always ready for action.

Four cycle engine—High tension magneto—open impeller pump. All parts easily accessible.

Air-cooled—cannot freeze in cold weather—does not heat up in hot weather.

GREATEST PUMP VALUE IN AMERICA

No. 1½—$100.00 (F.O.B., N. Y.)

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TRENCH & MARINE PUMP CO.
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To make your unwatering and water supply problems easier!

THIS Morris Portable All-Purpose Pump handles anything from clear water to floating dirt, sand and gravel, delivers 300 to 600 gals. per min., can be used for heads up to 50 ft., and is easy to cart from one job to another. For general water supply, unwatering excavations, sumps, etc., it can't be beat.

Write for literature about this and other sizes of Morris Pumps

MORRIS MACHINE WORKS, Baldwinsville, N.Y.

MORRIS
CENTRIFUGAL PUMPS

O.K.

Air Compressors

Portable Elevators

Portable Hoists

are O. K.!

Use More Air—

Air tools lower construction costs. O.K. Compressors are darned good workers. They keep tools humming all the time.

Powerful engines that hit on four all the time. *Special* safety device when load is released. *Special* clutch for starting engine without compressor load. *New*, stronger radiators. Special valves.

Get one and put it to work. Prices on request.

We want a few live agents. Write.

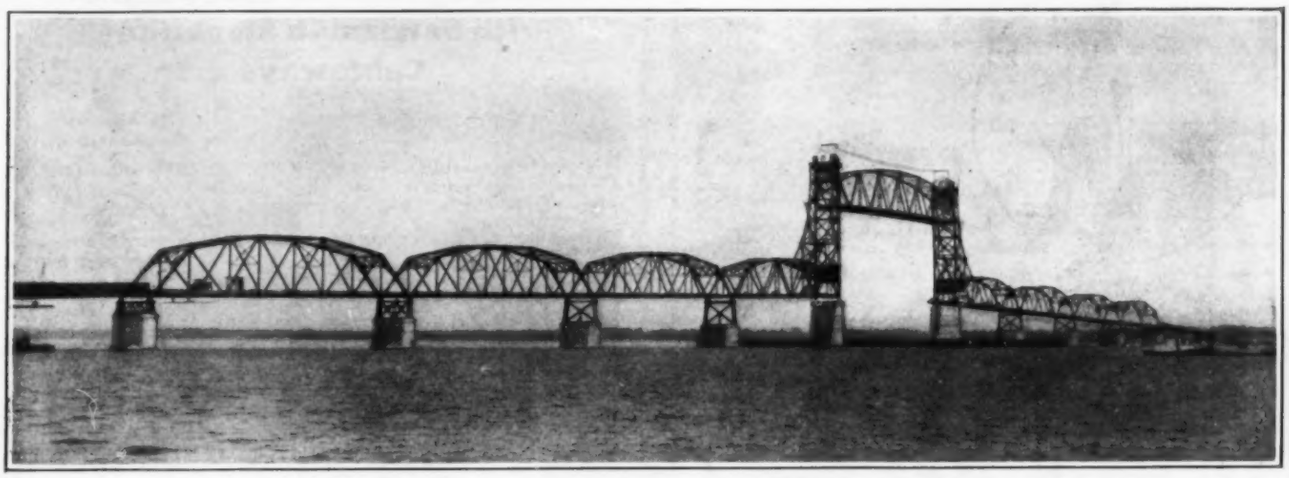
O.! K!

O.K. Clutch and Machinery Co.
P. O. Box 305 Columbia, Pa.

LAMBERT

HELPS MAKE ANOTHER RECORD

This Time It's on the **JAMES RIVER BRIDGE JOB**



Two Big LAMBERT Gasoline Hoists and Two LAMBERT Derricks Handled the Concrete for the Turner Construction Co.

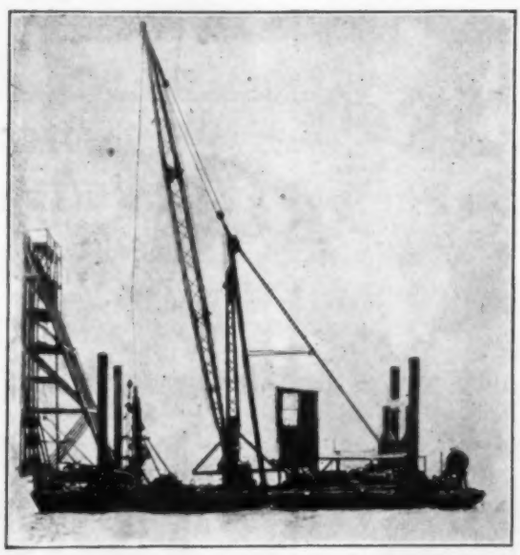
WITHOUT DELAYS—ALWAYS RELIABLE

25-TON LAMBERT DERRICK

Handled the Concrete Piles for Raymond Concrete Pile Co.

LAMBERT
Hoists and Derricks
Must give unusual
Service

We Co-operate
With Our Customers
To The Utmost With
Resulting
Mutual Satisfaction



HOISTS

ELECTRIC
GASOLINE
STEAM
BELT

DERRICKS

ALL TYPES
TIMBER
STEEL

CRANES

REVOLVING
TRAVELING
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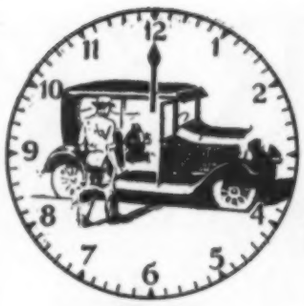
LAMBERT HOISTING ENGINE COMPANY

117 POINIER ST. *Main Office and Works* **NEWARK, N. J.**



Compact . . . . .
Stows in 1 x 1¼ x 2 ft.

Portable . . . . .
Weighs 95 lbs.

20 ft. suction lift
Maximum head 50 ft.

7500 gal. per hr.
4 to 5 hrs. per gal. gasoline

Homelite

Portable Centrifugal Pump

See exhibit at the Cleveland Road Show, Jan. 14-18

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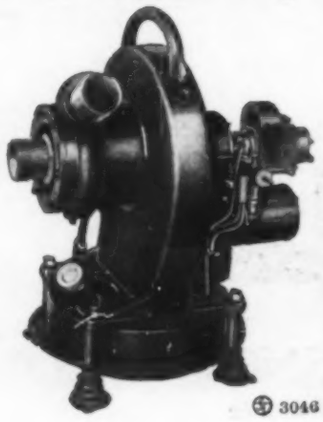
Distributors in principal cities throughout the world for demonstration, sales and service.



3046

Building 15 Miles of Embankment with Sauerman Slackline Cableways

The program of enlarging the reduction works at Anaconda, Montana, called for the building of 15 miles of embankment.

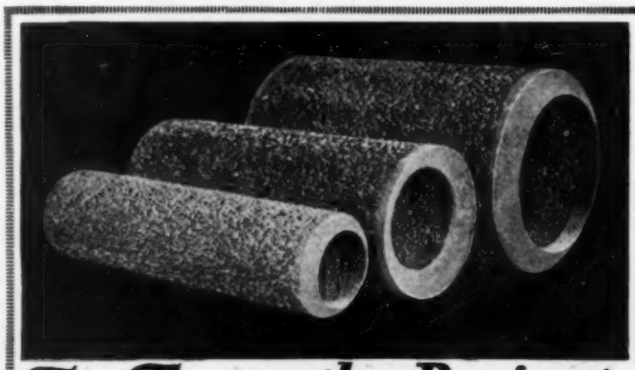
In order to accomplish the work in the shortest possible time at the lowest possible cost, they installed five 2-cu. yd. Sauerman Slackline Cableways to handle the excavating.

These machines did all the work that excavating, elevating, and hauling equipment combined would do. They cost far less initially—they required less upkeep—they operated on a smaller payroll (one operator for each machine).

If you are considering an earth moving job, a dam, reservoir or other project where the haul is 200 to 1,000 ft., even though the job differs from the one above, it will pay you to look into the cost-saving advantages of Sauerman Slackline Cableways.

SAUERMAN BROS., Inc.

480 S. Clinton St., Chicago



Ten Times the Drainage Capacity of Other Pipes

"A FOOT OF DRAINAGE FOR EVERY FOOT OF PIPE"

"The Water Seeps in and Then Flows Through"

"NO OPEN JOINTS"

Walker Cement Products, Inc.

Little Ferry N.J.

Plants at Little Ferry, N.J. & Baldwin L.I. N.Y.

WALKER POROSWALL RAPID DRAIN PIPE

Sweeping The Industrial Field *now Lakewood* Swings To Novo Rollr Power

On and on, like a great tital wave, Novo power is sweeping the industrial field. For manufacturers are finding in Novo 1, 2 and 4 cyl. engines a *new type of performance*—that means smoother operation—longer life—and lower maintenance costs for both the engine and the equipment it powers.

And now the Lakewood Type F Screed runs smoothly and surely on Novo Rollr power.

For the Lakewood Mfg. Company found that the *vibrationless* operation of the Novo 2 Cyl. Rollr Engine enabled their Type F Screed to turn out much smoother pavement than had been possible before.

And, as so many industrial users have learned, Novo Rollr Engines do much more than eliminate vibration — tests show ½ the gas consumption — several per cent more horse power — quarter turn cranking — unusual durability and other important advantages that mean satisfied users.

Write for complete information and a copy of the special Novo Rollr Engine catalog today.

A smoother concrete road for Novo 2 cylinder Rollr Engines now used on the Lakewood Type F Screed lick vibration as it has never been lickrd before.

NOVO ENGINE COMPANY, 214 Porter St., Lansing, Mich.
CLARENCE E. BEMENT, Vice-Pres. and Gen. Mgr.

NOVO

PUMPS — ENGINES — HOISTS

Service, parts and sales in 65 cities

"Have one on us"

The MORETRENCH WELLPOINT SYSTEM makes "Every Job a Dry Job." And as a by-product—there is the water—coming out of the pumps as clear as crystal. Where there is no danger of pollution the men drink it—it is cold and good. Pipe it from the pumps to the concrete mixer—no water bill to pay on that, is there? Wash off the forms—settle the dust—use it for anything good water can be used for. No objections to letting it flow into catch basins—no settling boxes needed—no mud. "It's pure, that's sure" and your job is made dry—no ditches—no sumps—frequently no sheeting or bracing—and NO DEFICITS.

Catalog for the asking.

MOORE TRENCH MACHINE CO.
Rockaway, N. J.

Conveying Excavators, Wellpoint System

HUMDINGER PUMPS

Non-clogging, everlasting rubber ball valves, totally enclosed, running-in-oil jacks, bronze bushed bearings, all steel trucks, and enclosed engine crank cases make HUMDINGER PUMPS.

THE CONTRACTOR'S CHOICE

Full detail description given in Bulletin No. 1034 CM. Send for a copy.

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Factory: Hackensack, N. J.

TARPAULINS

MADE OF HEAVY MATERIAL, THOROUGHLY WATERPROOFED, DOUBLE STITCHED SEAMS, REINFORCED PATCHES WHERE STRAIN COMES AT GROMMETS AND ROPES

ALL GRADES AND SIZES IN STOCK, CAN MAKE IMMEDIATE SHIPMENT

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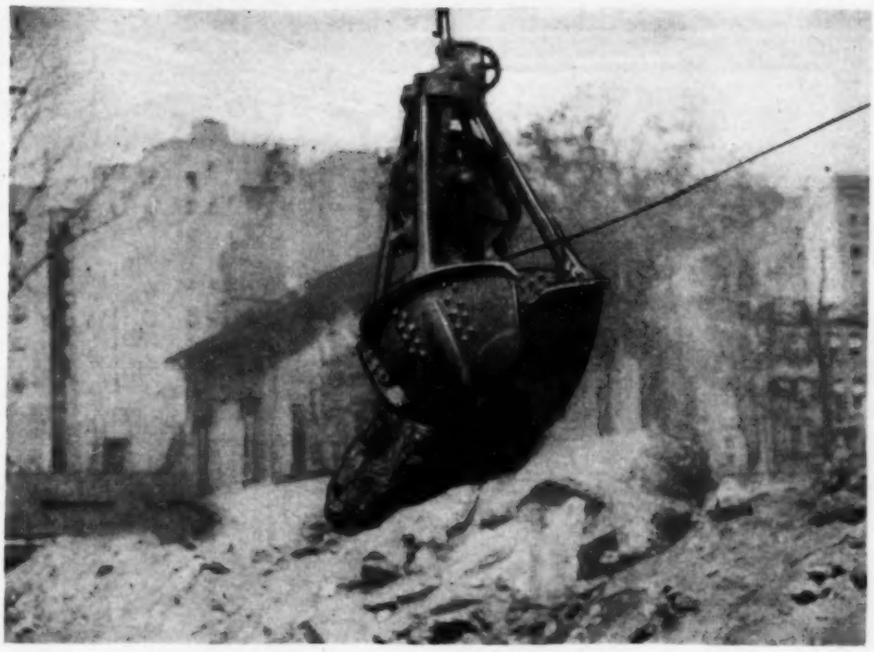

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A Hayward Orange Peel is a two-line power-wheel bucket, one line for closing and digging, and the other for holding the bucket during the discharge.

Bulletin No. 655 describes fully the Hayward Standard Orange Peel, and illustrates its use in contracting work. Let us send you a copy.

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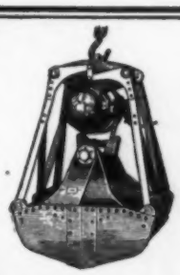
44 Dey St. New York, N. Y.

Builders of Clam Shell, Drag Line, Orange Peel and Electric Motor Buckets; Dredging, Excavating, and Coal Handling Machinery, Automatic Take-up Reels; Counterweight Drums.

HAYCO

Hayward Buckets

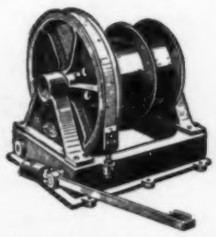


Electric Motor Buckets

Clam Shell Buckets

Orange Peel Buckets

Drag Line Buckets



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Automatic Take-Up Reels

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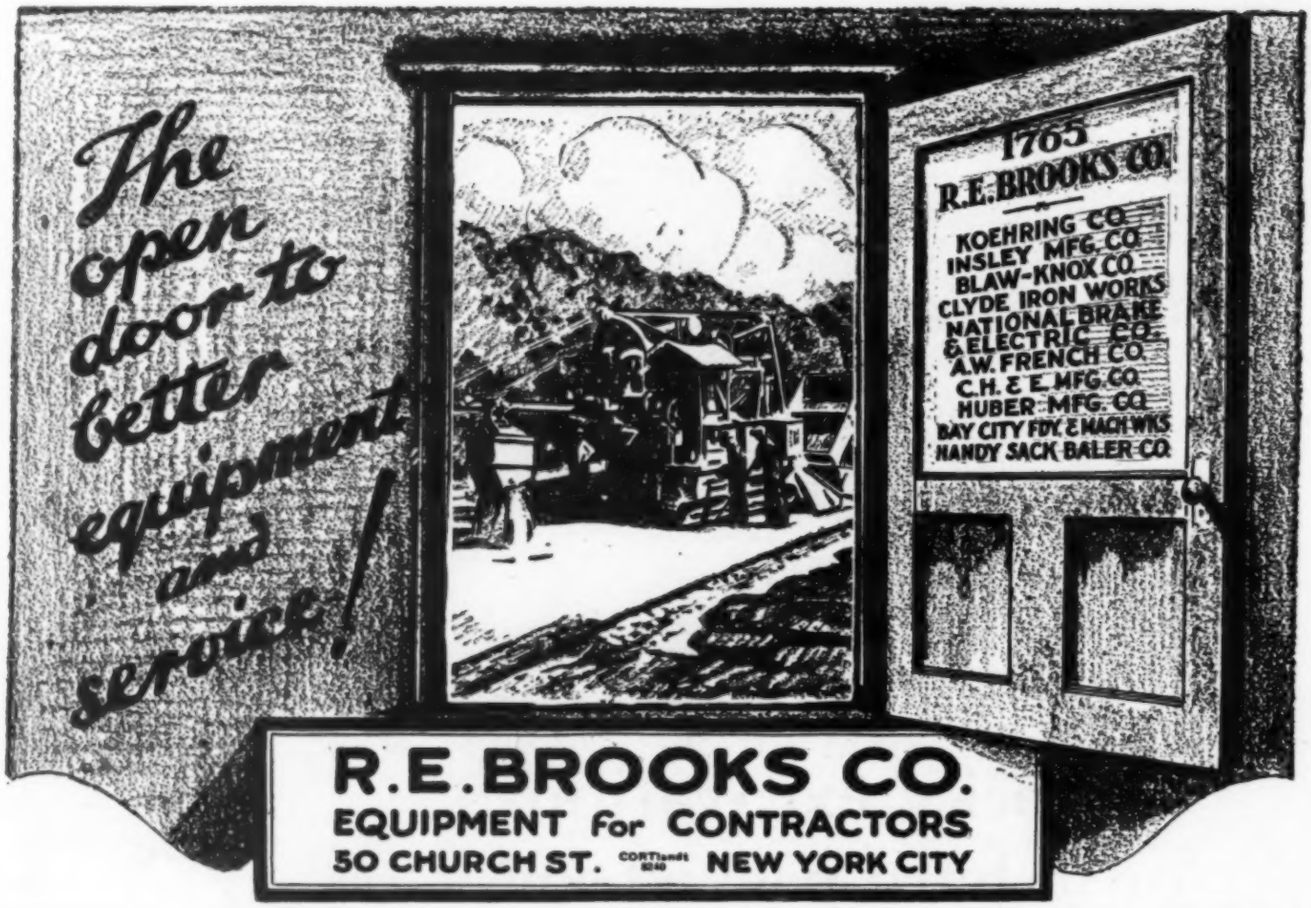

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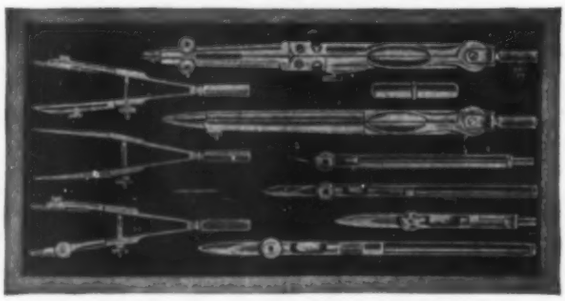

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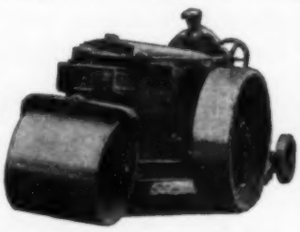

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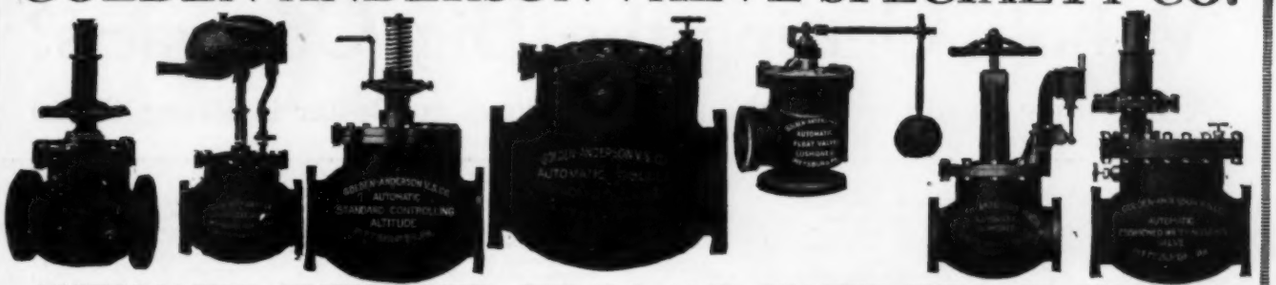

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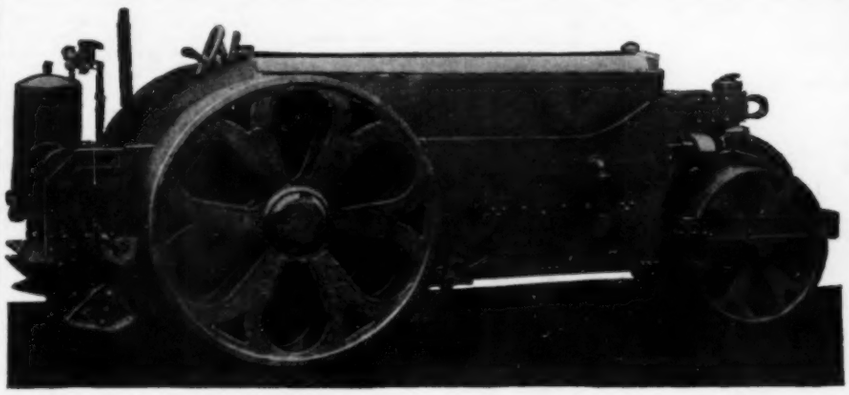

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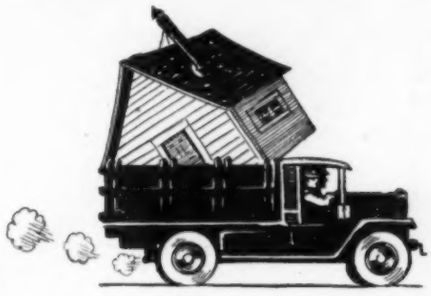

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City..... State.....

TO

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Company Employed by or Business Connection.....

Nature of Business..... Title.....

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A Monthly Guide to Where the Construction Dollar is Being Spent

Far West

San Francisco, Calif.
Apartments: $500,000
Morison Bros., 475 Sixth St., San Francisco.
Apartment: $700,000
D. Paganini, Clwnie Bldg., San Francisco.
Los Angeles, Calif.
Hospital: $285,000
Richards-Neustadt Constr. Co., 117 W. 9th St., Los Angeles.
Port Townsend, Wash.
Apartment: $200,000
J. Hudson, Empire Bldg., Seattle. Owner-builder.
Longview, Wash.
Longview-Rainer Bridge: $5,800,000
Steel—Wallace Steel & Bridge Co., Seattle, Wash.
Approaches—Pacific Bridge Co., E. Salmon St., Portland, Ore.
Walla Walla, Wash.
Infirmary: $229,000
N. P. Severin Co., 222 No. Adams St., Chicago.
Los Angeles, Calif.
Store and Apartment: $200,000
W. B. Hess & Co., 426 Merchants Nat'l. Bank Bldg., Los Angeles, Owner-builder.
Santa Cruz, Calif.
Hotel: $300,000
C. M. Swenson, 1256 Washington Ave., San Jose, Calif.
San Diego, Calif.
Mercantile building: $300,000
Scofield-Twaits Co., Pacific Finance Bldg., Los Angeles.
Los Angeles, Calif.
Warehouse: $225,000
P. A. Palmer Co., Insurance Exch. Bldg., Los Angeles.
Store and Apartment: $225,000
A. T. Lane, 253 S. Broadway, Los Angeles.
Apartment: $300,000
W. B. Hess, 426 Merchants Nat'l Bank Bldg., Los Angeles. Owner-builder.
Apartment: $200,000
Davis Constr. Co., 117 W. 9th St., Los Angeles.
Calexico, Calif.
Hotel: $300,000
O'Neil Constr. Co., H. W. Hellman Bldg., Los Angeles.

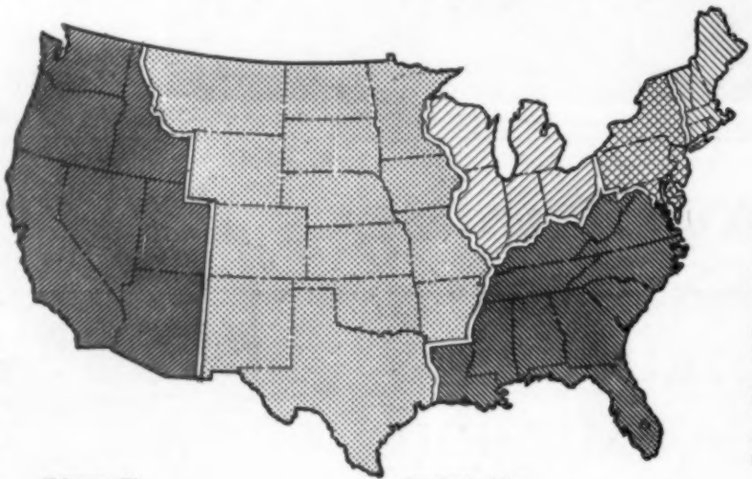
West of the Mississippi

Houston, Tex.
Store: $500,000
Southwestern Constr. Co., West Bldg., Houston.
Davenport, Ia.
Offices: $260,000
Priester Constr. Co., Kahl Bldg., Davenport.
Oklahoma City, Okla.
Laundry: $250,000
Reinhart & Donovan, Trade Nat'l Bank Bldg., Oklahoma City.
Crystal City, Mo.
Glass Factory: $750,000
Pittsburgh Plate Glass Co., Frick Bldg., Pittsburgh. Owner-builder.
Iowa
State Highway: $1,465,607
S. J. Groves & Sons Co., Inc., 306 Globe Bldg., Minneapolis, Minn., and others.
San Antonio, Tex.
Market: $500,000
American Building Co., Real Estate Bldg., San Antonio. Owner-builder.
Bank and Office: $600,000
McKenzie Constr. Co., Travis Bldg., San Antonio.
Dallas, Tex.
Power Plant: $2,500,000
Dallas Power & Light Co., Interurban Bldg., Dallas. Owner-builder.
Montana
State Highway: $360,644
T. Staunton, Great Falls, and others.
Nebraska
State Highway: $178,393
Abel Constr. Co., 308 Terminal Bldg., Lincoln, and others.
Beaumont, Tex.
Oil Tank, Loading Facilities: $750,000
Reeves Bros., Martin Bldg., Birmingham, Ala.

Denver, Colo.
Courthouse and City Hall: $4,242,871
Varnum & Bate, 2311 Tenth St., Denver.
Kansas City, Mo.
Temple: $1,500,000
Swenson Constr. Co., Shuber Bldg., Kansas City
Sioux Falls, S. D.
Theatre: $1,000,000
Reliable Constr. and Investment Co., 310 So. Michigan Ave., Chicago.
Kansas City, Mo.
Orphanage: $200,000
H. H. Fox, 3101 E. 30th St., Kansas City.

Middle West

Pontiac, Mich.
School: $364,000
Pryale Constr. Co., 405 Pontiac Bank Bldg., Pontiac.
Owosso, Mich.
High School: $316,115
D. Boschina, Crooks Rd., Royal Oak, Mich.
Detroit, Mich.
College: $1,000,000
W. E. Wood Co., 1805 Ford Bldg., Detroit.



Chicago, Ill.
Office: $2,100,000
H. Ericsson Co., 228 N. LaSalle St., Chicago.
Apartment: $240,000
Heil Constr. Co., 4353 Diversey Ave., Chicago.
Apartments: $2,750,000
Douglas Constr. Co., 134 N. La Salle St., Chicago.
Apartment: $1,500,000
Turner Constr. Co., 228 N. La Salle St., Chicago
Columbus, O.
Police Station: $650,000
Boyajohn & Barr, 299 So. Park St., Columbus.
Milwaukee, Wis.
Factory: $250,000
Dohlman Constr. Co., 456 Broadway, Milwaukee.
Illinois
State Highway: $1,433,405
Stevens Bros., 612 Endicott Bldg., St. Paul, Minn., and others.

Michigan
State Highway: $405,000
State Constr. Div., Lansing, C. M. Zeigler, Supt.

Saginaw, Mich.
Shipping Dock: $500,000
W. J. Meagher, Fay Bldg., Bay City.
Oak Park, Ill.
Schools: $400,000
A. Caron & Son, 1121 Williams St., Chicago.
E. L. Archibald Co., 111 W. Washington St., Chicago.

Elmhurst, Ill.
High School, $350,000
J. C. Coberg, 262 W. Fremont St., Elmhurst, masonry and carpentry.
Cincinnati, O.
School: $669,799
Penker Constr. Co., 123 Valencia St., Cincinnati.

South

Louisville, Ky.
Hospital: $150,000
H. A. Doll & Co., 1114 Lexington Rd., Louisville
Chattanooga, Tenn.
Apartment: $200,000
A. Dragoo, Hamilton Bank Bldg., Chattanooga.
Sparta, Tenn.
Silk Mill: $75,000
Foster & Creighton Co., 4th and 1st St. Bldg., Nashville.
Kentucky
State Highway: $443,013
Barton & Tye, Fullerton, Ky., and others.
Florida
State Highway: $1,157,099
W. J. Bryson Paving Co., Jacksonville, and others.
Miami Beach, Fla.
Dog Track: $150,000
Harrison Constr. Co., Miami.

Cleveland, Miss.
School: $235,000
Currie & Corley, Raleigh, Miss.
Shreveport, La.
Hospital: $119,474
H. & B. Constr. Co., Ricon-Brewster Bldg., Shreveport.
South Carolina
State Highway: $1,058,213
R. G. Lassiter & Co., Raleigh, N. C., and others.
Oxford, Miss.
Dormitories: $430,000
Ester-Reed Co., Jackson, Miss.
Memphis, Tenn.
Bank: $800,000
S. & W. Constr. Co., Shrine Bldg., Memphis.
Milledgeville, Ga.
Hospital: $283,330
Wagar & Co., Norris Bldg., Atlanta.

Middle Atlantic

New York, N. Y.
Station Finish: $345,973
Charles Meads & Co., 217 W. 14th St., N. Y. C.
Station Finish: $633,000
Huber Constr. Co., 103 Park Ave., N. Y. C.
Washington, D. C.
Gov't Printing Office Extension: $823,700
Rust Eng. Co., American Nat'l Bank Bldg., Pittsburgh, Pa.
Nurses Quarters: $272,000
Murch Bros. Constr. Co., Ry. Exchange Bldg., St. Louis, Mo.

Pittsburgh, Pa.
Apartment: $2,000,000
Sumner Sollitt Co., 307 No. Michigan Ave., Chicago
East Orange, N. J.
Apartment: $220,000
Warren & Warren, 31 Clinton St., Newark, N. J.
Atlantic City, N. J.
Hotel: $350,000
J. Mathis & Son, Guarantee Trust Bldg., Atlantic City.
Asbury Park, N. J.
Apartment: $500,000
I. R. Taylor & Co., 906 Asbury Ave., Asbury Park.
New York, N. Y.
Apartment: $375,000
C. R. & S. Constr. Corp., 3150 Rochambeau Ave., N. Y. C.
Brooklyn, N. Y.
Apartment: $250,000
Sudia Building Corp., 16 Court St., Brooklyn.
Philadelphia, Pa.
Paving: $366,650
Duffin Bros., Penn & Womrath Sts., Philadelphia, and others.
Pennsylvania
State Highway: $1,321,829
David Schoentag, Inc., Saugerties, N. Y., and others.
Hillside, N. J.
Sewer: $457,123
Decker & Canning, Falls Bldg., Union, N. J.
Long Island City, N. Y.
Sewers: $381,493
P. J. Greenough, 9919 Guilford Ave., Forest Hills, N. Y., and others.
Brooklyn, N. Y.
Incinerators: $1,218,800
Hiler Eng. & Contg. Co., 122 Livingston St., Brooklyn.
M. W. Kellogg, 71 Dey St., N. Y. C.

New England

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Marc Eidlitz & Son, 41 E. 42d St., N. Y. C.
Needham, Mass.
Church: $150,000
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School, $400,000
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Hartford, Conn.
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Apartments: $300,000
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Groton, Mass.
Warehouse: $150,000
Fiske-Carter Constr. Co., 11 Foster St., Worcester.
Fairfield, Conn.
Factory: $155,000
E. & F. Constr. Co., 94 Wells St., Bridgeport.
Worcester, Mass.
Home: $200,000
L. Rocheford & Son, 44 Front St., Worcester.
Turners Falls, Mass.
Church: $150,000
J. J. Roberts, 4 Wall St., Worcester.
Nantucket, Mass.
High School: $180,000
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Bridgeport, Conn.
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This index is published as a convenience to the reader. Every care is taken to make it accurate, but *Construction Methods* assumes no responsibility for errors or omissions.

Page

A

Aeroil Burner Co., Inc. 62
Anti-Hydro Waterproofing Co.. 56
Austin Western Road Mchry. Co. 42-43-55

B

Baker Mfg. Co. 53
Barber-Greene Co. 66
Bates Valve Bag Corp. 65
Bay City Dredge Works. 66
Brooks Co., R. E. 78
Browning Crane Co. 66
Buckeye Tent, Awning & Mfg. Co. 76
Bucyrus-Erie Company 37
Buffalo-Springfield Roller Co.. 78
Buhl Company 68

C

Carter Co., Ralph B. 76
Caterpillar Tractor Co. 38
Cleveland Rock Drill Co. 70
Cleveland Tractor Co. 36
Clyde Iron Works Sales Co. 69
Construction Machinery Co.... 64
Continental Motors Corp. 3rd Cover

D

Dietz Co., R. E. 47
Domestic Engine & Pump Co.. 83

Page

E

Eisemann Magneto Corp. 71

F

Fate-Root-Heath Co. 61
Foote Company 52
Foundation Co. 49
Fundom Hoist & Shovel Co.... 70

G

General Electric Co. 40
Golden-Anderson Valve Spec. Co. 79

H

Hauck Mfg. Co. 58
Hayward Co. 77
Hercules Motors Corp. 46
Homelite Corporation 74
Huber Mfg. Co. 79
Hughes-Keenan Co. 50-51

I

Ingersoll-Rand Co. .....2nd Cover
Insley Mfg. Co. 84
International Cement Corp. 67

J

Jaeger Machine Co. 64

Page

K

Kolesch & Company 78

L

Lakewood Engineering Co..... 44
Lambert Hoisting Engine Co... 73
Leach Company 45
LeRoi Company 59
Leschen & Sons Co., A...4th Cover
Lincoln Electric Co. 57
Lowell Wrench Co. 47

M

McGraw-Hill Book Co. 60
Monarch Tractor Corp. 41
Moore Trench Machine Co..... 76
Morris Machine Works. 72

N

Northwest Engineering Co..... 39
Novo Engine Co. 75

O

O. K. Clutch & Mchry Co.... 72
Owen Bucket Co. 54

Page

P

Plymouth Locomotive Works... 61
Porter Co., H. K. 63

R

Rogers Brothers Corp 58

S

Sauerman Bros. 74
Schramm, Inc. 68
Searchlight Section 81-82
Starrett Co., L. S. 60
Sterling Wheelbarrow Co..... 56
Sullivan Machinery Co..... 68

T

Thew Shovel Co. 35
Trench & Marine Pump Co.... 72

U

Union Carbide & Carbon Corp. 48
Union Iron Works. 70
Universal Crane Co.....18-19
Universal Portland Cement Co.. 2

W

Watson-Stillman Co. 62
Walker Cement Products, Inc.. 74

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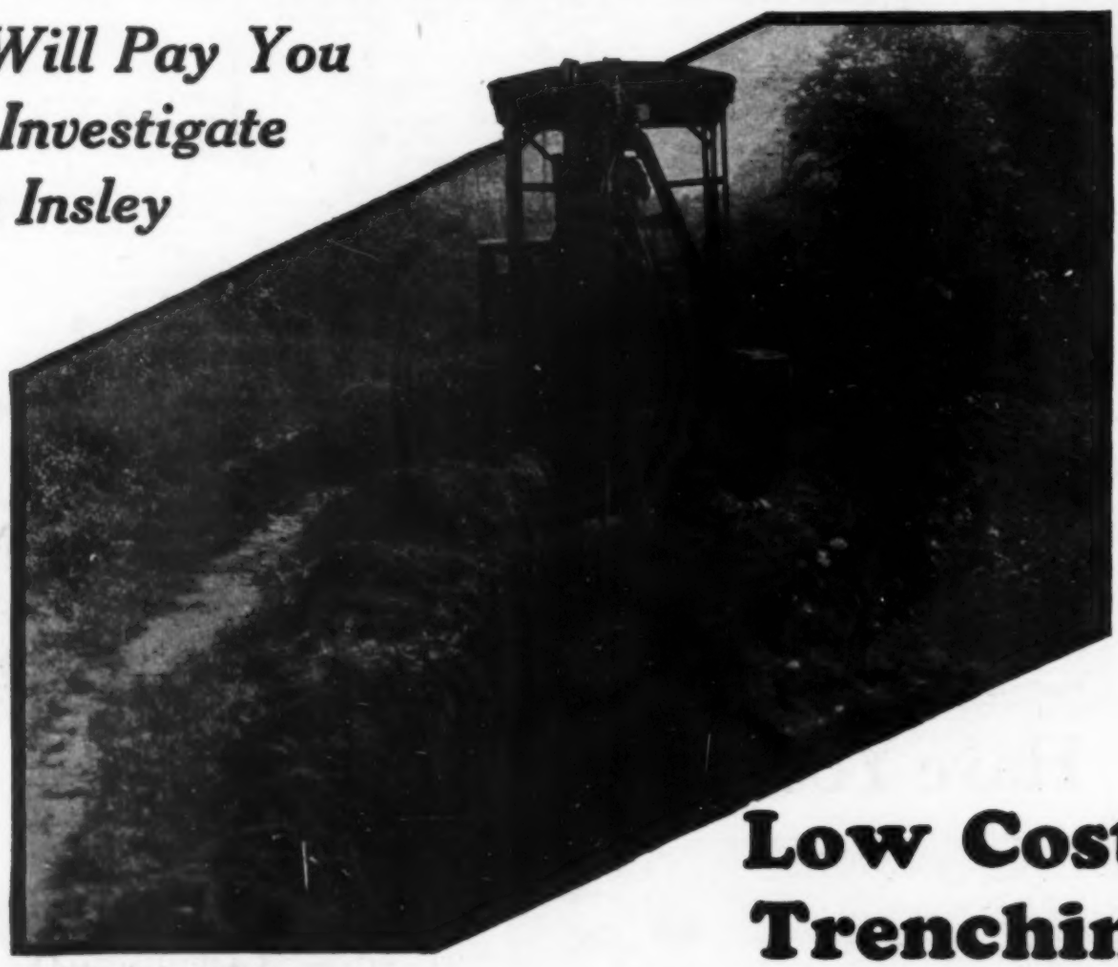

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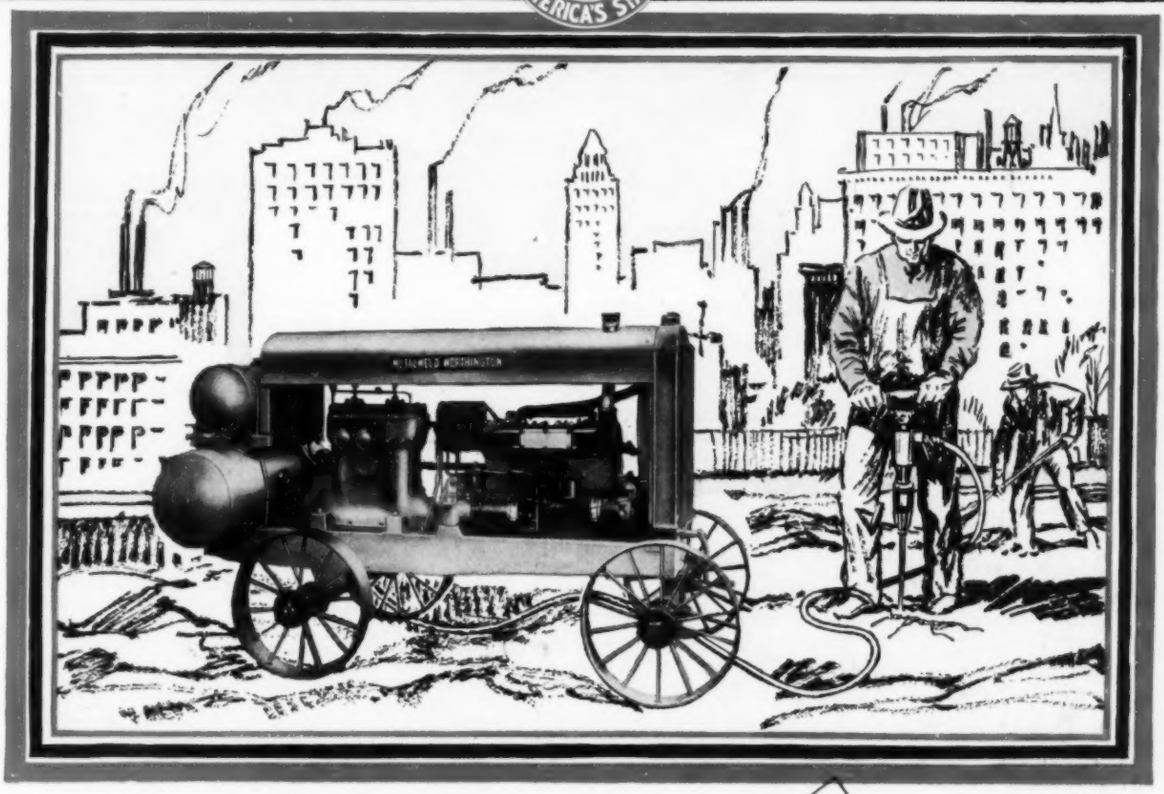

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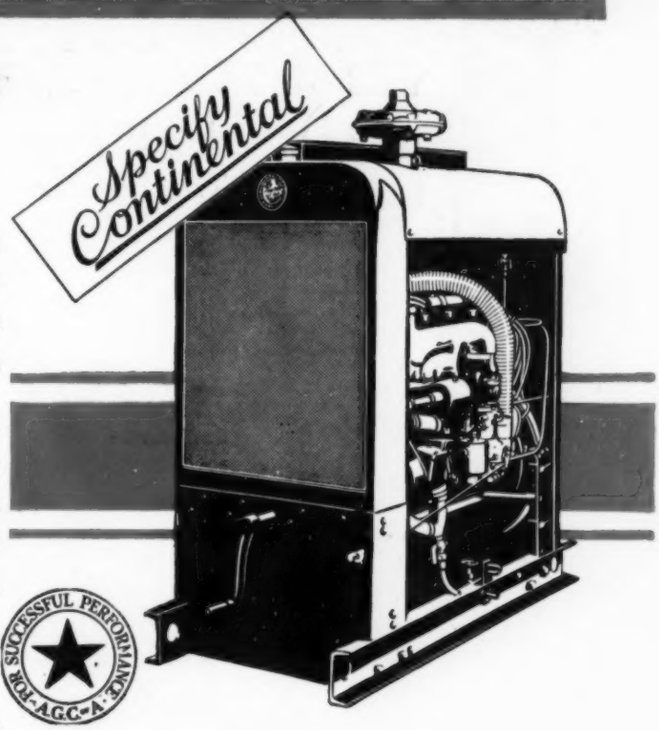
That Metalweld-Worthington Air Compressors stand up under terrific strains accounts in part for their wide popularity.

Above is shown a 210 cu. ft. Metalweld-Worthington Compressor in action powered with a Continental B7 engine and equipped with electric starter.



Red Seal Continental Industrial Products will be on exhibit at the Cleveland Road Show.

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Made of
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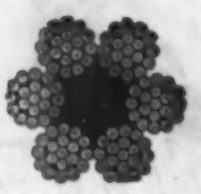
For heavy work of all kinds we recommend "HERCULES" (Red-Strand) Wire Rope, because of its extra strength, extra toughness, and extra durability.

Leschen Wire Rope is made in both the Round Strand and the Patent Flattened Strand constructions. Tell us how you use wire rope and we shall be glad to suggest the right kind for your work.



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